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Instituto de Ciências Matemáticas e de Computação

**A FAST Hardware Decoder Optimized for Template Features to Obtain Order Book Data in Low Latency**

**Caio César Soares Oliveira**

Dissertação de Mestrado do Programa de Pós-Graduação em Ciências de Computação e Matemática Computacional (PPG-CCMC)



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# A FAST Hardware Decoder Optimized for Template Features to Obtain Order Book Data in Low Latency

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com o Template para Obter Dados do Livro de Ofertas em  
Baixa Latência**

Dissertação apresentada ao Instituto de Ciências  
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de Mestre em Ciências – Ciências de Computação e  
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Matemática Computacional

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**USP – São Carlos**  
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*“Computers aren’t the thing. They’re the thing that gets us to the thing.”*  
*(Joe)*



# RESUMO

**OLIVEIRA, C. C. S. Um Decodificador FAST em Hardware Otimizado de Acordo com o Template para Obter Dados do Livro de Ofertas em Baixa Latência.** 2022. 153 p. Dissertação (Mestrado em Ciências – Ciências de Computação e Matemática Computacional) – Instituto de Ciências Matemáticas e de Computação, Universidade de São Paulo, São Carlos – SP, 2022.

Os sistemas do tipo *High Frequency Trading* (HFT) exigem alto desempenho computacional para negociação em tempo real e para análise de dados. O protocolo FAST, uma extensão do protocolo FIX, é um dos principais padrões adotado por esses sistemas. Este trabalho implementa um componente *open source* em *hardware* baseado em FPGA para decodificar mensagens financeiras e emitir as *tags* necessárias para atualização do livro de ofertas. O componente implementa as versões dos protocolos FAST e FIX adotados pela bolsa brasileira B3. O *hardware* proposto decodifica mensagens com latência média de 0.72us, e *throughput* médio de 1.4 milhões de mensagens FAST por segundo, representando uma redução de duas ordens de magnitude em comparação com a mesma implementação executada em processador de *software*.

**Palavras-chave:** FPGA, Market Data, FAST, HFT.



# ABSTRACT

OLIVEIRA, C. C. S. **A FAST Hardware Decoder Optimized for Template Features to Obtain Order Book Data in Low Latency.** 2022. 153 p. Dissertação (Mestrado em Ciências – Ciências de Computação e Matemática Computacional) – Instituto de Ciências Matemáticas e de Computação, Universidade de São Paulo, São Carlos – SP, 2022.

High-Frequency Trading (HFT) systems require high computational performance for real-time trading and data analysis. The FAST protocol, an extension of the FIX protocol, is one of the main patterns adopted by these systems. This work implements an open-source component in FPGA-based hardware to decode financial messages and output the necessary tags for order book updates. The component implements the FAST and FIX protocols versions adopted by the B3 Brazilian stock exchange. The proposed hardware decodes messages with an average latency of 0.72us, and average throughput of 1.4 millions FAST messages per second, representing a reduction of two orders of magnitude compared to the same implementation executed in a software processor.

**Keywords:** FPGA, Market Data, FAST, HFT.



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# LIST OF ABBREVIATIONS AND ACRONYMS

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AQ	Automated Quotation
ASIC	Application Specific Integrated Circuits
AT	Algorithm Trading
B3	<i>Brasil Bolsa Balcão</i>
CBT	Computer-Based Trading
DMA	Direct Market Access
DSP	Digital Signal Processing
DUT	Device Under Test
FAST	FIX Adapted for STreaming
FF	Flip-Flop
FIX	Financial Information eXchange
FPGA	Field-Programmable Gate Array
GPU	Graphics Processing Unit
HFT	High Frequency Trading
HLS	High Level Synthesis
HPC	High-Performance Computing
LUT	Look-up Table
NASD	National Association of Securities Dealers
NASDAQ	National Association of Securities Dealers Automated Quotations
NASDAQ	National Association of Securities Dealers Automated Quotations
NIC	Network Interface Controller
NYSE	New York Stock Exchange
PMap	Presence Map
RTL	Register Transfer Level
S.O.	Operating System
SBE	Simple Binary Encoding
SOH	Start of Header
TOB	Top Of Book



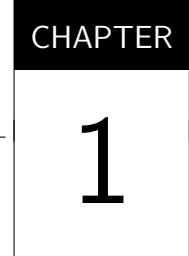
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# INTRODUCTION

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The financial market had their trades done in physical locations for hundreds of years, when its agents met to negotiate the papers of their interests. In 1971 the National Association of Securities Dealers (NASD) debuted its computer-assisted Automated Quotation (AQ), which became the National Association of Securities Dealers Automated Quotations (NASDAQ) ([GOMBER \*et al.\*, 2013](#)). Along with the advance in communication technologies, the financial market has become highly automated, allowing online access to most of its services, including trading and market data. Algorithms deployed as trading robots can access real time data about offers, trades, and news, and use them in their trading strategies to generate orders to the market in a completely automated mode.

This level of integration allows the implementation of High Frequency Trading (HFT) systems, which are algorithms able to execute automated strategies to operate in the market in a very short time slice and without no human interaction. Because of the paradigm of these systems, these algorithms performance are highly dependent on low latency solutions for both data analysis and trading logics. As said by [Gomber \*et al.\* \(2011\)](#), HFT is not a strategy itself, but a system that needs technology from the state-of-art to be applied in the access to the market, with the communication with market data feeder, and to the routing of the orders. This approach aims to improve the profits from already known trading strategies. So, any logical strategy of traders can be implemented in those systems ([WANG; ZHENG, 2014](#)).

The market data are transmitted through an Ethernet connection. The packet is read and unmounted, returning a financial message in some given communication pattern. Then, this message is decoded, and the order book can be built. The traders use it to monitor the prices and demand for a specific stock, future, currency, and option, to decide what to trade. These systems demand the fastest connection to communicate with the market, such as accessing the market data and sending orders.

The order book organizes the bid options, which are the buying offers, and the offers

options, which are the selling offers. It is sorted according to their prices, so the highest bid and the lowest ask prices are on the Top Of Book (TOB). Basically, an order book is a showcase where products from different sellers and different prices are listed. In this sense, the same product can vary its price given the seller ([ALDRIDGE, 2013](#)). The HFT strategy often uses the TOB in order to make the decisions and send to the broker the financial orders as fast as possible.

Communication with stock exchange systems are mostly available through the Financial Information eXchange (FIX), available on canonical or on encoded versions, such as FIX Adapted for STreaming (FAST) and Simple Binary Encoding (SBE) ([FIXTRADING, 2018](#)) ([LI \*et al.\*, 2014](#)). In the canonical format, the messages to be transmitted are excessively verbose and not appropriated for HFT systems. On the other hand, the encoded format reduces the message size significantly, however it needs an extra encoding and decoding step, what increases the complexity of the system.

Hardware solutions for the market data decoding have been exploited as a way to improve throughput and to reduce latency ([LOCKWOOD \*et al.\*, 2012](#)). Provided as a logical circuit, the time for decoding each element of the message is known in advance, given to the traders a better prediction about the expected delay for data access. In this work, we propose an Intellectual Property (IP) component based on Field-Programmable Gate Array (FPGA) that implements a FAST message decoder in hardware.

## 1.1 Objective

The main objective of this work is to implement a hardware component based on FPGA for the FAST message decoder algorithm to be used as an open source hardware to support the development of High Frequency Trading Systems.

## 1.2 Specific Objectives

- To implement a FAST decoder version in software supporting B3 template and that can be used as a golden model to validate an equivalent RTL implementation in FPGA.
- To design a hardware in RTL to explore hardware parallelism, aiming to minimize latency and maximize throughput.
- To create a testbench to build the order book aggregated by price and validate the results.

## 1.3 Motivation

High-Frequency Trading is a way of trading that uses algorithms capable of performing trading in a very short period, usually in the order of nanoseconds. This form of trading was one

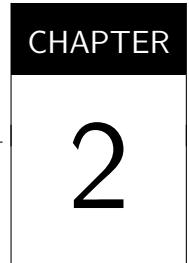
of the leading agents that changed the composition of the market in recent years, together with the increased use of trading algorithms (LI *et al.*, 2014).

Due to the nature of this trading paradigm, which requires extremely low latency to respond to market updates, the use of FPGA has proven to be adequate to accelerate different components of an HFT system. This acceleration can happen in several layers, such as network, protocol parsing, order book manipulation, and trading algorithms (BOUTROS *et al.*, 2017). In this meaning, the FPGA is more efficient compared to the Graphics Processing Unit (GPU) since they cannot offer such low latency due to their internal pre-defined pipeline and memory organizations, Application Specific Integrated Circuits (ASIC) are a better technology in this sense, however they lack of reconfigurability to better support the introductions of new protocol versions (LOCKWOOD *et al.*, 2012).

## 1.4 Document organization

The second chapter describes the main concepts related to High-Frequency Trading, such as the main communication protocols used in the financial market, and the Related Works, approaching the main concepts and methodologies similar to the proposal of this research. The third Chapter contains the Implementation, which details the materials and methods used for the experimental part of the study. Finally, the conclusions are presented.





# FUNDAMENTAL CONCEPTS

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## 2.1 HFT

This section aims to introduce the necessary concepts to understand the HFT paradigm. Section 2.1.1 disposed of the contextualization of the HFT, while Section 2.1.2 fell on the technology approach of an HFT system. Section 2.1.3 covers about some market strategies applied in these systems, and Section 2.1.4 shows the relation between FPGA and HFT.

### 2.1.1 *Contextualization*

HFT-orientated tradings are performed by computer systems, commonly by software, which can execute operations in a fraction of second. These systems can generally reach the scale of milliseconds, or even into nanosecond scale for those with higher performance. Computers with high processing performance are needed for this approach, since these systems use complex algorithms to analyze market options and thus make decisions regarding trades. Besides the application level, it is also necessary to process the network packets, decode the messages through a financial information protocol, and build the order book. Then, the systems with better performance have competitive advantages over others.

The term HFT appeared in 2000, referring to systems capable of executing financial orders through algorithms without human interaction. In 2010, the Securities and Exchange Commission estimated that HFT systems executed more than 50% of transactions in the second half of the decade (BOUTROS *et al.*, 2017).

The Government Office For Science (2012) shows the major technological advances that has led to the HFT paradigm. In the last quarter of the 20th century, Computer-Based Trading (CBT) was already for trading automation. In addition, the use of complex mathematical models applied in the risk management context, the growth of market data, and the Direct Market Access (DMA) are also appointed.

Not all strategies need such technological apparatus to be successful. However, many of them depend on the speed which they can identify and respond to some profitable opportunity in the market. The speed is given by the meaning of sending an order to take advantage of a certain opportunity before another does ([BURBIN, 2010](#)).

According to [Vaananen \(2015\)](#), an HFT system can be divided into some main points, namely:

- Fast algorithms: the algorithms of HFT systems look for small changes in asset prices, taking advantage of these opportunities to buy or sell shares. The idea is to do this countless times a day in order to accumulate these small gains.
- Fast computers: this trading paradigm is possible with the use of high-performance computers.
- Proximity to server: these computers may also be placed geographically close to stock exchange servers.
- Buy and Sell in Small Lots: these systems execute trades with a small volume of shares, such as 100 to 200 at a time. Meanwhile, the algorithm must look for information about other opportunities in order to trade recent bonds and thus make a profit.

[Gomber et al. \(2011\)](#) classifies the HFT as a type of Algorithm Trading (AT) and defines a list of characteristics that are often assigned to these systems:

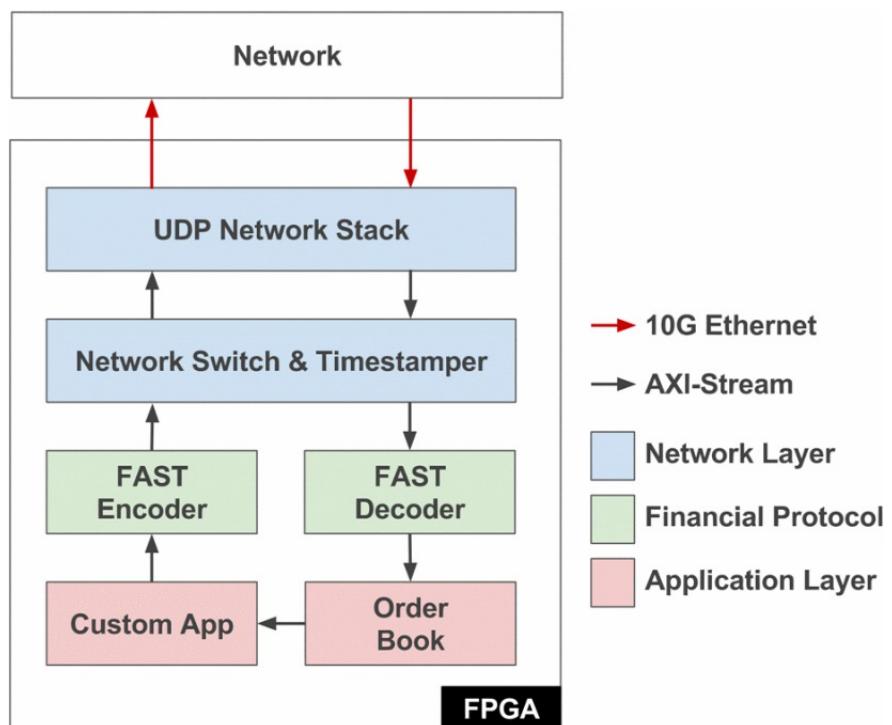
- The decisions of the trades strategies are pre-designed.
- The HFT algorithms are used by professional investors.
- The system monitors the market data in real-time.
- The sending of the orders is automatized.
- The management of the orders is automatized.
- The algorithms operate without human intervention.
- The systems use Direct Market Access (DMA).

### 2.1.2 HFT Machine

The Figure 3 shows the market data part of an HFT system, which is typically composed of four main layers, as follows: network stack, financial protocol engine, order book, and application. The network layer performs the packing and unpacking operation according to the communication protocol adopted. The financial protocol engine processes this data to build the

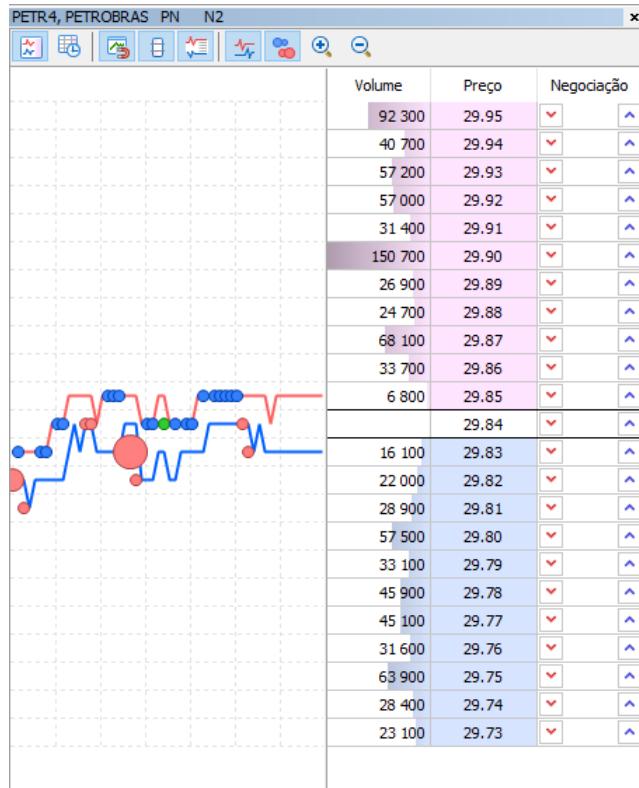
order book or to send orders to the financial market. The engine usually works to encode and decode FIX/FAST based messages. The order book is a list of buy and sell offers organized in priority order. The Figure 2 shows an order book example from PETR4, with is the preferred stock from Petrobras. Finally, the application layer implements strategies to generate trading orders to the financial market. Note that, HFT systems usually have a channel just to receive market data encoded with FAST or SBE protocols and another channel just to send trading orders. The first uses UDP and the latter TCP network connections.

Figure 1 – Block diagram of an HFT system, specifying the market data part of the structure



Source: [Boutros et al. \(2017\)](#).

Figure 2 – Order book example taken from MetaTrader v.5.



Source: [MetaTrader \(2021\)](#).

HFT can be implemented only in software, which tend to have high latency, requiring a significant processing power to keep in pace with the current high volume of data available. The FAST protocol is able to reduce the volume of data significantly, and it is still widely used. However, the decoding process is highly sequential, limiting the speed-up by parallel processing. Thus, acceleration paradigms in software such as parallelization by threads are not efficient ([TANG et al., 2016](#)). Heterogeneous systems, which integrate soft-cores processors and customized hardware for specific problems are solutions that can provide the benefit of RTL parallelism and the flexibility of the software in a standalone system ([NANE et al., 2016](#)).

The application of High-Performance Computing (HPC) in this field has a considerable growth in the last decade in order to reduce the latency of these systems. This is due to the introduction of new technologies in the financial market, impacting its buying and selling mechanism, which buyers need to find sellers as quickly and efficiently as possible and vice versa. For this reason, several techniques have been developed in order to identify the best trading opportunities, such as mathematical and artificial intelligence models ([GERLEIN et al., 2014](#)), as well as acceleration techniques. Another technique used to mitigate the latency is the use of general-purpose processors with specialized Network Interface Controller (NIC) ([BOUTROS et al., 2017](#)).

### 2.1.3 HFT Strategies

The strategies basically use heuristics to know what and when to operate, trying to gain profits through the variations of the stock prices, through the demand, or among distinct exchanges. They try to accumulate tiny gains within various transactions. For this, the strategies join current and historical market data. They do not use to hold a position for much time, usually with only some seconds. To be fast enough, the algorithms are simple and fast.

When some strategy decision is made, the following step is to send the order into the exchange through a broker with the decision made. The broker is the intermediary between the trader and the stock market. It is a trading infrastructure that connects to the client and forwards his orders to the exchange. ([LOCKWOOD et al., 2012](#)).

There are many HFT strategies, and they are dynamically modified with the time.

The liquidity-providing strategy consists of gaining profits on the bid-ask spread, which means the gap between what buyers are disposed to pay and what sellers are disposed to put on sale. Two points that can contribute to the profits in each buy and sell operation are the high volatility and the distance between the bid and the ask spread ([KUMAR, 2021](#)). One more option is the arbitration strategies, which correlate the price information and the underlying price of a stock or derivate. Another heuristic falls on the liquidity detection, which is the strategy that consists of sending small orders to try to find larger orders in order to be leveraged by the traders ([LEBER; GEIB; LITZ, 2011](#)). The slippage refers to the difference between the executed price of a trade and its expected price. It usually happens with higher volatility periods or when there are a large number of orders for a given price but not enough volume to maintain the bid-ask spread in that chosen price. So, the price of the security dispels from its expected price because of the many market orders for this given security ([LOCKWOOD et al., 2012](#)).

It is possible to note that all the strategies described above require extremely low latency since only the fastest HFT system will achieve profits in a given market opportunity. The system requires to be able to take decisions in real-time to the market events. Because of this, these computers could be installed inside the stock markets, which guarantees that all the machines are equidistant from the server of the vendor, the feed handler. It ensures that no machine will be impaired given the latency difference because of the length of the Ethernet cable.

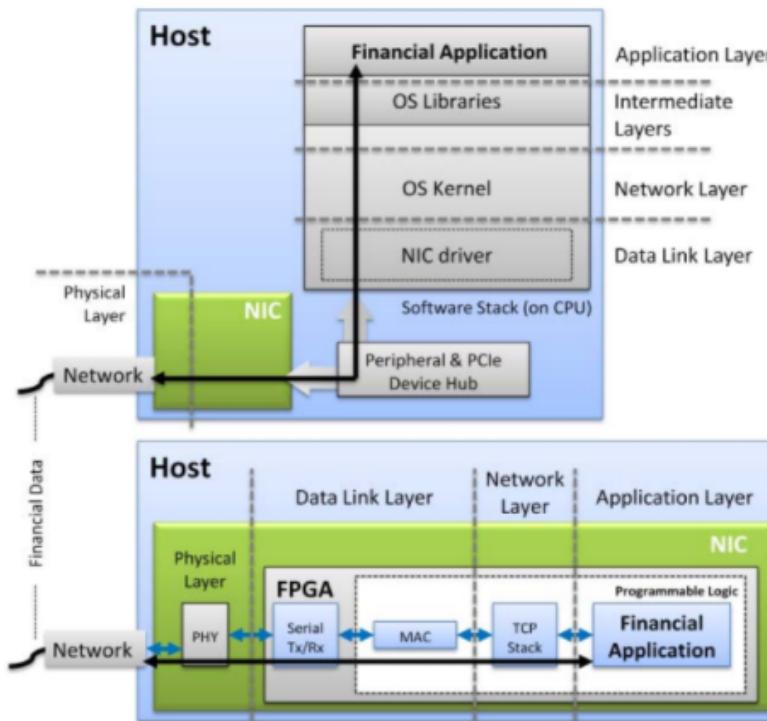
### 2.1.4 HFT and FPGA

Due to the demand for low latency systems, FPGA implementations have been used because of their flexibility and programmability. Since the development of specialized hardware started to gain more attention within this domain. This can reduce latency several times compared to the above solutions, such as with NIC ([BOUTROS et al., 2017](#)).

[Lockwood et al. \(2012\)](#) presents a comparison between a software and an FPGA-based HFT system, depicted in Figure 3. In hardware, the Ethernet packets from the stock market can be

entirely processed inside a custom and optimized architecture without needing a general-purpose CPU. Unlike the software implementations, in which the packets are written to the memory, and the CPU is interrupted to process the market information. Then the packet is mounted and sent to the network. The complex Operating System (S.O.) scheduling, cache misses, the interruption in the software stack increases the latency of the system.

Figure 3 – The data flow difference between a software and a hardware-based FPGA system.



Source: [Lockwood et al. \(2012\)](#).

The nature of the FPGA in having flexible architecture turns possible high-performance computing. FPGA-based systems can eliminate the competition for resources, as happens in software-based systems, by exploring spatial processing. Moreover, offering more deterministic processing latency ([GERLEIN et al., 2014](#)).

## 2.2 FIX and FAST Protocol

The protocols are communication standards used to turn possible that different entities can exchange information. The FIX Protocol, and its compressed format FAST Protocol, are the two most used protocols in the financial market. The patterns are used by financial institutions such as brokers, banks, stock exchanges, and end-users to transmit market information among them.

Many stock exchanges adopt them as a standard form of computer communications, such as New York Stock Exchange (NYSE), National Association of Securities Dealers Automated Quotations (NASDAQ), London Stock Exchange, and *Brasil Bolsa Balcão* (B3).

### 2.2.1 FIX Protocol

The development of FIX began in 1992 to electronically communicate capital transactions between an investment manager (buy-side) and a broker (sell-side) (LI *et al.*, 2014). FIX Protocol Limited was established in 1999 as a company. All the activities from the protocol have FIX Protocol Limited as a global umbrella. Before FIX, transactions were commonly done over the phone (FIXTRADING, 2018).

According to (FIXTRADING, 2018), the FIX protocol favor the business to reduce the phone calls and exchange of letters, and improve the quality of the information to the target recipients. In the context of technology, it provides an open standard that benefits the creation of links with a wide range of counter-parties. For vendors, the pattern offers a ready access to the industry, increasing the number of clients.

The protocol is maintained and updated by the FIX Trading Community (<<https://www.fixtrading.org/overview/>>). It is open-source, free, and non-proprietary. It uses text messages to specify its commands. These characteristics allow that any company can develop its own communication systems for this protocol. The standard supports various financial products, such as equities, fixed income, derivatives, and forex. Currently, the protocol is considered the global language of the financial market (LI *et al.*, 2014).

FIX messages are strings of ASCII characters fields containing “tag = value” fields separated by the Start of Header (SOH) character. Each tag has its own set of allowed values that can be integer, float, char, boolean, string, or UTC timestamp. The message content is case sensitive.

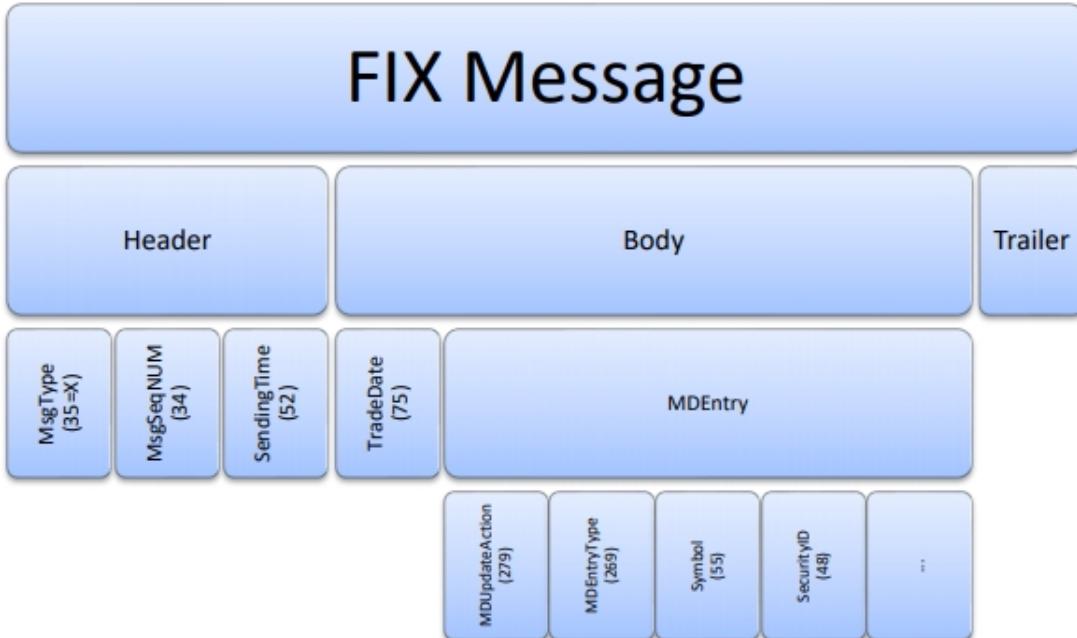
A message has a Header, a Body, and a Trailer (B3, 2019) (FIXTRADING, 2018). The header holds the message type and length. The body contains the message payload and can be of two type:

- Session: administration messages to manage connections, such as access control and link status monitoring. Examples of this family of messages are the Heartbeat message, indicated by the tag 35=0, Logon (35=A), Logout (35=5).
- Application: trades and market data exchange messages. Examples are New Order Single (35=D), Market Data Snapshot Full Refresh (35 = W).

The trailer is an optional checksum used to confirm the content of the message. It consists in a summation of the ASCII values of all the FIX message characters, except itself.

Figure 4 shows an example of a Market Data Incremental Refresh (35=X) FIX message, following the format previously explained.

Figure 4 – Organization of a FIX message



Source: B3 (2019).

The mechanism used to encode and decode FIX messages is known as FIX engine. For example, the FIX canonical message in Chart 1 represents an order book update. The SOH delimiters are replaced by vertical bars for better viewing.

Chart 1 – Example of an order book update FIX message

1128=9   35 = X   34 = 732046   52 = 20130710124510273   75 = 20130710   268 = 1   279 = 0   269 = 1   22 = 8   207 = BVMF   48 = 3940368   83 = 793   270 = 2   273 = 124510269   271 = 15   272 = 20130710   37016 = 20130710   37017 = 124510269   37 = 80142490094   289 = 98   290 = 5
---

Source: Extracted from the B3 FIX messages log.

This set of fields is the whole message, where the fields meaning are the following:

- Tag 1128 = 9 (ApplVerID = 9): specifies the version of the FIX protocol, which is FIX50SP2.
- Tag 35 = X (MsgType = X): informs the type of the message. The ‘X’ character means that it is a market data message for incremental refreshing.
- Tag 34 = 732046 (MsgSeqNum = 732046): counts the sequence number of the message, that is 732046.

- Tag 52 = 20130710124510273 (SendingTime = 20130710124510273): it is the time of message transmission.
- Tag 75 = 20130710 (TradeDate = 20130710): indicates the day of a trading.
- Tag 268 = 1 (NoMDEntries = 1): points that the number of market data entries is 1.
- 279 = 0 (MDUpdateAction = New): represents the market data update action, which is a new position in the order book.
- 269 = 1 (MDEntryType = Offer): references that the update of the order book must occur in the offer side.
- 22 = 8 (SecurityIDSource = 8): specifies the class or the source of the SecurityID.
- 207 = BVMF (SecurityExchange = BVMF): used to identify a security.
- 48 = 3940368 (SecurityID = 3940368): identifies the code identification of the security.
- 83 = 793 (RptSeq = 793): it is used to carry reporting sequence number of the fill.
- 270 = 2 (MDEntryPx = 2): informs the price of asset, which is BRL 2.
- 273 = 124510269 (MDEntryTime = 124510269): informs the time of the market data entry.
- 271 = 15 (MDEntrySize = 15): points the number of assets of the respective price.
- 272 = 20130710 (MDEntryDate = 20130710): informs the date of the market data entry.
- 37016 = 20130710 (MDInsertDate = 20130710):
- 37017 = 124510269 (MDInsertTime = 20130710):
- 37 = 80142490094 (OrderID: 80142490094): it is a unique identifier for order as assigned by sell-side.
- 289 = 98 (MDEntrySeller = 98): selling party in a trade.
- 290 = 5 (MDEntryPositionNo = 5): represents the position of the order book, that is 5.

The items above are the message responsible to update an order book. To sum up, this message contains instructions to insert a new line at position 5 of the offer side of the order book for the Security 3940368, adding volume 15 at price BRL 2.00.

For example, the tag 35 above, which indicates the type of the message, can be valued by the following values:

- $35 = 0$  (Heartbeat): It is used to monitor the status of the communication.
- $35 = D$  (NewOrderSingle): It is used to submit orders to a broker for execution.
- $35 = X$  (MarketDataIncrementalRefresh): It is used for incremental updates of new, changed, or deleted market data entries of trades, quotes, etc.

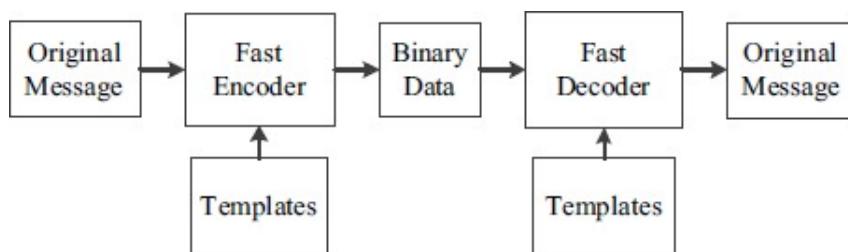
Note that tag 35 can have other values as well, which meaning are available at the service provider.

### 2.2.2 FAST Protocol

The FAST protocol extends the FIX protocol and aims to increase data transmission capacity by applying compression techniques to reduce the message size. FAST encoding optimizes the representation of data, reducing redundancy by encoding the text format “tag = value” into a binary format.

The compression of the FAST protocol occurs through templates that describe all existing fields in the message, as well as the order of the bytes, their sizes, their operators, and their meanings. Templates avoid the need of transferring the tags to describe the meaning of the value. The template is stored both in the sender and on the receiving side to be able to execute the encoding and decoding process, and no information about the template is sent in the message header. The added overhead in FAST due to the encoding and decoding algorithm is offset by reducing the data volume to be transmitted ([B3, 2019](#)). In Figure 5, it is possible to observe the flow of the encoding and decoding processes of a FAST message.

Figure 5 – Flow of a FAST message



Source: [Li et al. \(2014\)](#).

[Table 1](#) demonstrates a FAST message example from Brasil Bolsa Balcão (B3), used to transmit a message over UDP. FAST messages have a header called "technical header", which is not related to the header explained in the FIX Protocol section. This header is unencoded and corresponds to the first 10 bytes of the message. This header is composed by the MsgSeqNum, the same as tag 34, by the NoChunks and CurrentChunk fields, used when a message exceeds the User Datagram Protocol (UDP) packet limit, and the MsgLength field, which informs the message size in bytes. This header allows the engine to detect sequence number gaps before decoding

the message by the MsgSeqNum field. In the case of messages bigger than the UDP packet size, the NoChunks informs the number of the chunks of the message, while the CurrentChunk gives the current message chunk, which is used to recompose messages by concatenating all the chunks in a single message. Lastly, to previously inform the length of the message, which helps to concatenate the bytes of each message, which is given by the MsgLength field.

Table 1 – B3 FAST message format.

Unencoded header				FAST encoded message
MsgSeqNum	NoChunks	CurrentChunk	MsgLength	FAST message
4 bytes	2 bytes	2 bytes	2 bytes	MsgLength bytes

Source: ([B3, 2019](#))

Chart 2 shows technical header and the encoded FAST message. Given the canonical message from Chart 1, its size could be reduced from 240 to 90 bytes, including the unencoded technical header.

Chart 2 – Example of a complete UDP payload containing a message with technical header and its FAST encoded message. This example is a command to update the order book.

```
00 0B 2B 8E 00 01 00 01 00 50 C0 01 91 2C 57 8E 23 61 18 63 10 30 78 C1 09 4C 57 97 81
7B 3C 09 C0 80 B1 01 70 40 90 06 99 81 82 80 80 3B 2F 40 BD 90 09 4C 57 97 09 4C 57 97
3B 2F 40 BE 80 80 80 80 38 30 31 34 32 34 39 30 30 39 B4 39 B8 86 80 80 80 80 80 80
80 80 80
```

Source: Extracted from the B3 FAST messages log.

The FAST protocol supports the following data types: ASCII strings, unicode strings using UTF-8, byte vector, decimal numbers, signed and unsigned integers of 32 and 64 bits.

The following subsections introduce the features used for data compression, such as the rules for identifying the values of the fields, the present fields in the message, and other required computations.

### 2.2.3 Implicit Tag

The goal of implicit tagging is to remove the data redundancy of the fields filled by the application, which in the case of the FIX protocol traditionally uses the pattern [tag=value][separator][tag=value][separator], that overloads the volume of the data.

For example, the tag, formed by one or more characters, can be removed from the message as long as its sequence is known, making the fields implicit so that only the field value is sent. For this, FAST requires a pre-defined sequence in the order of these fields so that the encoding algorithm can perform the compression, although FIX allows an arbitrary order of them. The order of the fields is explicit in the templates, and there is one for each type of message.

## 2.2.4 Binary Encoding

It applies binary encoding to the values of the data fields. To do it, each ASCII character representing the value is converted to seven bits, leaving the eighth bit reserved to indicate whether that byte is the last from a sequence of bytes in the respective field.

For example, the field 34=732046 from the Chart 1 example becomes 0X2C578E from Chart 2. Note that when referring to FIX, each character needs one byte to be stored, which in this case is reduced from 9 to 3 bytes when stored in binary format.

## 2.2.5 Stop Bit

After reading the technical header fields, a FAST decoder, also known as engine, starts to decode the encoded message. Since the FAST message fields have no fixed length, to split the sequence of bytes into their respective fields, the protocol defines that the MSB (Most Significant Bit) of each byte represents the stop bit.

Taking the starting three bytes of the previous message body from Chart 2 (C0 01 91) converted to binary, the two fields are obtained: field 1: 11000000, and field 2: 00000001 10010001. Then, after removing the MSB bit of each byte and concatenating the remaining parts, the two fields result in 40 and 00 91 in hex.

## 2.2.6 Presence Map

Each FAST encoded message starts with the Presence Map (PMap), such as at the beginning of every sequence, a mask that specifies which fields or sequences are present. The existent fields are known by the decoder from the FIX template, which are associated to the respective order of PMap bits. Bit 1 means the fields is present and 0 the opposite.

From the previous message example (Chart 2), the byte C0 is the PMap field, resulting in hex 40 (1000000) after removing the MSB bit. It means that only the first field is present in the message, which is the TemplateID field. There is another PMap before the MDEntries sequence (better explained in Subsection 2.2.11), which is given by the bytes 7B 3C 09 C0.

## 2.2.7 Template

A template holds a set of rules used by the engine to guide the necessary computation required to decode the message, by specifying to which field each value refers to, including their operators, sizes, and meanings. Each field has a name and a type, that can be a sequence type (item 2.7) or a primitive type. Each template has its own TemplateID, and they are usually provided as XML files shared between the sender and the receiver. In the example of Chart 3, there is a retracted version of the B3 FAST template, which TemplateID is 145.

Chart 3 – Example of a B3 FAST template.

---

```

1 <template name="MDIncRefresh_145" id="145" dictionary="145">
2   <string name="ApplVerID" id="1128">
3     <constant value="9" />
4   </string>
5   <string name="MsgType" id="35">
6     <constant value="X" />
7   </string>
8   <uInt32 name="MsgSeqNum" id="34" />
9   <uInt64 name="SendingTime" id="52" />
10  <uInt32 name="TradeDate" id="75" presence="optional" />
11  <sequence name="MDEntries">
12    <length name="NoMDEntries" id="268" />
13    <uInt32 name="MDUpdateAction" id="279" >
14      <copy value="1" />
15    </uInt32>
16    ...
17  </sequence>
18 </template>

```

---

Source: Extracted from the B3 FAST template.

It is possible to observe some rules of the fields described in the template. In the example, the first two fields are constant, so these values will never be in the stream. For instance, the third field in the template (MsgSeqNum tag) will be the first in the stream, a 32 bits unsigned integer. The fourth field is the SendingTime, a 64 bits unsigned integer.

### 2.2.8 Operators

The Operators are used for field encoding. Each value in the stream can either have or not have a respective operation specified in the template. There are some kinds of operators such as:

- Copy: used when a field usually has repetitive value.
- Increment: operates an increment of 1 in the value.
- Delta: operates a subtraction from the previous and the current value.
- Default: defines a default value for a given field. If the value of the field is the same as defined in the template, it is not sent in the stream.
- Constant: the value of the respective field is always the specified in the template.
- Tailor: it is a concatenation operation used in string fields.
- None: none operation is applied.

Each one has a set of rules to decode the value received from the stream. So, the engine must store the values to compare the current value with the previous one. Sometimes, it will restore a previous value as a new value or use a constant or default value specified in the template. In these cases, the value does not need to be sent in the stream.

For example, for a copy operation, the rules specify that the value of the field can be either present in the stream or not. If the PMap bit is set, the actual value is the encoded value present in the stream. When it is not present, the actual value of the field could be the previous value, the initial value set in the template, or absent, depending on the previous status, which can be assigned, undefined, or empty. Moreover, the other operations rules are specified in the FAST Specifications manual ([FIXTRADING, 2016](#)).

### **2.2.9 Nullability**

The nullability property is applied when a field is optional and has no operator, which means that there is a kind of representation of NULL value given by the hexadecimal 80. Furthermore, the stream values from a nullable field need to be decremented by 1 during the process, if it is a non-negative integer field.

It happens because the 0 must be differentiated from NULL. So is defined that the NULL value is 0x80, given the stop bit. When sending a number, such as 0, the value is added by one, turning to 0x81.

For example, the MDEntrySize is a nullable field. So, considering the value of the field from [Char 2](#), which is 0x90, converted to the binary 10010000. Eliminating the MSB ( 0010000) and converting it to decimal is 16. So, the decoder must subtract 1, resulting in 15.

### **2.2.10 Decimal numbers**

The exponent and the mantissa are received in different fields in the stream, and there is a set of rules to decode them. The mantissa is present in the stream only if the exponent is present in the stream or in the initial value from the template. If these conditions are true, the next set of bytes represents the mantissa field. When exponent and mantissa are obtained, the following operation needs to be computed:

$$\text{mantissa} \times (10^{\text{exp}})$$

Given the example of [Chart 2](#), the MDEntryPx field decoder received a 0x81 as exponent from the stream. It is 10000001 converted to binary. When the MSB is removed, it results in 0000001, thus 1 in decimal. The field is nullable and receives a non-nullable value, so it must be subtracted by 1. Hence, the final result is 0.

Exponent 0 is not null, which means that there is a mantissa in the stream. So, the MDEntryPx's mantissa decoder process received the next byte, which is 0x82. So, as usual,  $0x82 = 10000010$ . Remove the MSB, 0000010. Then the result is decimal 2 for the mantissa. Thus, the process needs to compute:

$$2 \times (10^0) = 2$$

### 2.2.11 Sequence

A sequence is used as a message loop to transmit different values for a specific set of fields, without the need to transmit the whole message for each loop iteration. The number of interactions is defined by a field that is located before the sequence definition, the *NoMDEntries* tag. According to the Chart 4 example, the sequence is used to process a series of market data information, as order book update through MDEntryType and MDEntryPx tags.

Chart 4 – Example of a sequence definition in the B3 FAST template.

---

```

1 <sequence name="MDEntries">
2   <length name="NoMDEntries" id="268" />
3   <string name="MDEntryType" id="269">
4     <default value="0" />
5   </string>
6   <decimal name="MDEntryPx" id="270"
7       presence="optional">
8     <copy />
9   </decimal>
10 ...
11 </sequence>
```

---

Source: Extracted from the B3 FAST template.

## 2.3 Related Works

The low latency demanded by High-Frequency Trading systems increases the need for hardware accelerator, since customized hardware processors can have its architecture shaped to attend specific demands. FPGAs are suitable for this type of implementation as the hardware can be reconfigured to exploit spatial computation to reduce latency and also to implement deep pipelines to improve throughput.

Most of the works focus on accelerating one or more modules of the HFT system. Several of these implementations are in software, some in heterogeneous computing with specific hardware along with general-purpose processor, and others as a system-on-chip.

[Lockwood et al. \(2012\)](#) proposes a commercial IP for market data decoding, including other components, for network communication, external memory interface and software components for the host-hardware communication. Its hardware runs at 156MHz, achieving latency of 200ns for message parsing. The throughput of the system is 6.1M FIX messages per second, with the FIX messages having an average size of 150 bytes.

[Tang et al. \(2016\)](#) provides an IP library for the FAST decoder implemented in High Level Synthesis (HLS). The templates were implemented in a Xilinx Kintex-7 FPGA and contain 9, 11, and 21 fields. Depending on these sizes, the frequency varied from 200MHz to 155MHz. The hardware reached an average of 0.5us to 1.3us to decode each message, with  $1 \approx 2$  orders of magnitude faster than its software solution.

[Boutros et al. \(2017\)](#) also presents an HLS-based system that implements hardware components for a complete HFT system. The system runs at 156MHz, with 270ns average of round-trip latency, without considering the network stack, and 115ns of latency from the FAST decoder specific part. The work creates its own FAST template to better use the FPGA resources by computing only the needed fields. The table 2 shows the template created.

Table 2 – Template developed by Boutros.

Field	Size (bytes)
Presence Map	1
Template ID	1
Price (exponent)	1
Price (mantissa)	1-5
Order Size	1-2
Order ID	1-5
Order Type	1

Source: ([BOUTROS et al., 2017](#))

[Leber, Geib and Litz \(2011\)](#) presents a hardware solution in a Virtex-4 FPGA coded in RTL encompassing the components Ethernet, IP, UDP, and FAST protocol engine. A microcode engine with an instruction set and a compiler to support different trading protocols are also shown. The component responsible for FAST decoding achieves 160MHz, with a latency of 2.6us, considering both the latency of the Network Interface Controller (NIC) and the FAST decoding components.

The work of [Dvořák and Kořenek \(2014\)](#) demonstrates a hardware component for the order book layer. The design developed in RTL analyses the best bid and offer prices in the financial messages, and writes the updates of the order books of the instruments in an SRAM memory. The system has an average latency of 253ns and can handle almost 200000 instruments with 144 Mbit.

[Stratoudakis \(2011\)](#) consists of a white paper from Wall Street FPGA, which proposes

an FPGA acceleration for order cancellation, based on FIX, to avoid losses in case of emergency events in the market. The design, created using LabVIEW, accelerates a network card optimized for QuickFIX, an open-source FIX engine. The order cancel messages generated have a latency of 1874ns, considering the trigger until the whole message is on the wire.

[Pottathuparambil et al. \(2011\)](#) developed a feed handler and processing in FPGA-based hardware for the ITCH market data feed, which is disseminated by the NASDAQ stock market. The design, implemented in HDL and ImpulseC, can handle 120Mbps, with peak performance of 420 Mbps. The hardware has a latency of 2.7us, compared to 38 into 22us from the CPU-based system.

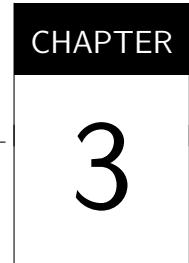
A CPU-FPGA hybrid sorted table to support the storage of order book in the range of gigabytes with a latency of nanosecond level is shown in the work of [Fu et al. \(2017\)](#). The FPGA cache table stores the top of the order book, while the other positions are stored in the host memory. The routines in the CPU provide a low latency communication, which is between 400 and 700ns.

[Gerlein et al. \(2014\)](#) shows an FPGA design of a multi-agent architecture to accelerate the order application layer. This trading engine executes pre-trade analyses, which consist of the calculations of technical indicators, that are followed by the adopted trading strategies. These calculations and the evaluation of the strategy until the output of a trading signal has a latency of 550ns.

[Hua Junkang Ren \(2013\)](#) designed a FAST decoder in FPGA-based hardware in this final report. The work consists of a hardware, synthesized in a Solarflare AoE board, able to receive the financial messages stream and decoding the fields. With the fields decoded, an order book is built to record the data extracted from the messages. An order book handler implemented in Python is used as a golden model to validate the algorithms.

To sum up, most of the mentioned works aim to take advantage of the flexibility and speed of FPGA devices to accelerate one or more layers of a high-frequency trading system. The hardware proposed in this work is developed in Register Transfer Level (RTL), aiming high performance. The proposed hardware can process FAST messages with the *NoChunks* equals to one, for the template ID 145 (MDIncRefresh), which is used to update the order book fields. It is a B3 template featuring 59 fields, which amplify the complexity of the development and compromise the results of the hardware, as seen in the [Tang et al. \(2016\)](#). As a solution, the necessary computation demanded by the fields is hard-coded in each necessary state to avoid communication bottleneck and time-consuming issues during the development. Besides that, the results achieved by this work are comparable to those with smaller templates.





# IMPLEMENTATION

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The FAST decoder was implemented in software to be used as a golden model, and in hardware. The software implementation is presented in [3.1](#) while the hardware in [3.2](#). The hardware validation occurs through an RTL testbench to stimulate the hardware and collect its results, which is depicted in [3.3](#). In this work, we provide a solution that can receive the FAST stream and process the messages in a three-stage pipeline. The first machine loads the bytes and verifies the necessary template engine. The second is an engine responsible for identifying the fields of the message from template 145, and the third outputs the necessary tags for order book updates.

## 3.1 Golden model

A software solution for the FAST decoder was developed in order to understand the decoding process demanded by the protocol, to implement and to test the algorithms needed, and such as to be used as a golden model to compare hardware versus software in relation to functionality and performance.

To validate the proposed IP, a log of FIX and FAST messages from B3 was used, which is provided as a raw message. Both FIX and FAST represent the same message in a given time slice. In Figure [6](#) and Figure [7](#) it is possible to visualize the two logs from B3. Note that the highlighted part from the FAST log are the bytes from the header. It is possible to observe that the first four bytes are the tag 34 from the FIX log (Figure [6](#)), which indicates that both are the same message. The software read the bytes from FAST log and convert them to the strings from FIX log.

The decoder was implemented to support the template MDIncRefresh\_145 since the system intends to build the order book. The template above is used for processing messages from the incremental stream, which disseminates incremental market data in real-time, such

0003cb60	10	32	70	c9	09	4c	57	97	83	5b	3c	0a	c0	80	01	68
0003cb70	42	e7	16	53	dc	ff	02	88	80	80	3b	31	38	c4	01	c9
0003cb80	09	4c	57	97	09	4c	57	97	3b	31	38	c4	80	80	80	80
0003cb90	38	30	31	34	32	34	39	30	32	34	b0	37	b2	84	80	80
0003cba0	80	80	80	80	80	80	80	80	21	8c	b4	12	c7	80	80	0d
0003cbb0	a5	80	80	80	80	80	86	80	80	80	80	80	80	80	80	80
0003cbc0	80	a3	c1	80	80	80	02	33	e9	80	d1	80	80	80	80	80
0003cbd0	80	80	80	80	80	80	80	00	0b	2b	f9	00	01	00	01	00
0003cbe0	52	c0	01	91	2c	57	f9	23	61	18	63	10	32	71	b4	09
0003cbf0	4c	57	97	81	79	3c	09	c0	80	b1	01	68	16	89	07	6d
0003cc00	de	0a	d3	80	80	3b	31	39	b0	01	c9	09	4c	57	97	09
0003cc10	4c	57	97	3b	31	39	b1	80	80	80	38	30	31	34	32	
0003cc20	34	39	30	32	34	b1	37	b2	8b	80	80	80	80	80	80	
0003cc30	80	80	80	00	0b	2b	fa	00	01	00	01	00	51	c0	01	91
0003cc40	2c	57	fa	23	61	18	63	10	32	7c	d8	09	4c	57	97	81
0003cc50	59	3c	0a	c0	80	01	68	16	89	07	6d	df	0a	85	80	80
0003cc60	3b	31	44	d4	02	ad	09	4c	57	97	09	4c	57	97	3b	31
0003cc70	44	d4	80	80	80	80	38	30	31	34	32	34	39	30	32	34
0003cc80	b3	37	b2	8b	80	80	80	80	80	80	80	80	80	80	00	0b
0003cc90	2b	fb	00	01	00	01	00	50	c0	01	91	2c	57	fb	23	61
0003cca0	18	63	10	32	7c	d8	09	4c	57	97	81	59	3c	0a	c0	80
0003ccb0	01	6d	73	8d	25	b5	0a	85	80	80	3b	31	44	d4	00	da
0003ccc0	09	4c	57	97	09	4c	57	97	3b	31	44	d5	80	80	80	80
0003ccd0	38	30	31	34	32	34	39	30	32	34	b4	37	b2	84	80	80

Figure 6 – FAST messages log

```

A22=8^A207=BVMF^A48=4002184^A83=5088^A270=30.65^A273=124541359^A271=85^A272=2013
0710^A37016=20130710^A37017=124541359^A37=80142490239^A289=72^A290=6^A
1128=9^A35=X^A34=732152^A52=20130710124542025^A75=20130710^A268=3^A279=0^A269=0^A
A22=8^A207=BVMF^A48=3809639^A83=371164^A270=26.4^A273=124542020^A271=200^A272=20
130710^A37016=20130710^A37017=124542019^A37=80142490240^A288=72^A290=3^A279=0^A2
69=4^A22=8^A207=BVMF^A48=3809639^A83=371165^A270=26.39^A273=124542020^A271=1900^
A272=20130710^A286=5^A279=0^A269=A^A22=8^A207=BVMF^A48=3809639^A83=371166^A273=1
24542020^A271=41300^A272=20130710^A277=Q^A
1128=9^A35=X^A34=732153^A52=20130710124542132^A75=20130710^A268=1^A279=0^A269=1^
A22=8^A207=BVMF^A48=3803913^A83=128734^A270=13.63^A273=124542128^A271=200^A272=2
0130710^A37016=20130710^A37017=124542128^A37=80142490241^A289=72^A290=10^A
1128=9^A35=X^A34=732154^A52=20130710124543576^A75=20130710^A268=1^A279=0^A269=0^
A22=8^A207=BVMF^A48=3803913^A83=128735^A270=12.85^A273=124543572^A271=300^A272=2
0130710^A37016=20130710^A37017=124543571^A37=80142490243^A288=72^A290=10^A
1128=9^A35=X^A34=732155^A52=20130710124543576^A75=20130710^A268=1^A279=0^A269=0^
A22=8^A207=BVMF^A48=3897741^A83=4789^A270=12.85^A273=124543572^A271=89^A272=2013
0710^A37016=20130710^A37017=124543572^A37=80142490244^A288=72^A290=3^A
1128=9^A35=X^A34=732156^A52=20130710124543588^A75=20130710^A268=1^A279=0^A269=1^
A22=8^A207=BVMF^A48=3803889^A83=11205^A270=12.5^A273=124543584^A271=100^A272=201
30710^A37016=20130710^A37017=124543584^A37=80142490245^A289=72^A290=4^A
1128=9^A35=X^A34=732157^A52=20130710124543605^A75=20130710^A268=1^A279=0^A269=1^
A22=8^A207=BVMF^A48=3897576^A83=513^A270=12.5^A273=124543600^A271=50^A272=201307
10^A37016=20130710^A37017=124543600^A37=80142490246^A289=72^A290=2^A
1128=9^A35=X^A34=732158^A52=20130710124543708^A75=20130710^A268=1^A279=0^A269=1^

```

Figure 7 – FIX messages log

as instrument updates and status. So, the implemented template serves to decode market data messages related to the order book information. The template mentioned is available on Annex A. The software, developed in C language, reads the B3 log byte by byte, which the first 10 bytes refers to the header of the message. From this header the message length field is accessed to buffer in an array all the remaining message fields. From this buffer, the PMap and TemplateID values are identified in order to use the appropriate decoder.

After concluding the decoding process, the content of the message is available to update an order book aggregated by price (in our case limited to 10 levels). The decoded messages are also stored in the canonical FIX format to be used for comparison against the original FIX message. In this work, a field to field compare operation was applied in order to validate the results. The Figure 8 shows a print of four converted FIX messages and the order book output from the software, by a given SecurityID. All the FIX messages from the print are initialized at the tag 1128=9. Notes the tags 268 (NoMDEntries), 279 (MDUpdateAction), 269 (MDEntryType), 48 (SecurityID), 270 (MDEntryPx), 271 (MDEntrySize), 290 (MDEntryPositionNo).

- The first message indicates a new position (MDUpdateAction = 0), with a volume of 1400 (MDEntrySize = 1400) by a price of 26.46 BRL (MDEntryPx = 26.46), in the bid size (MDEntryType = 0), at position 1 (MDEntryPositionNo = 1). There is a sequence loop of 3 interactions (NoMDEntries = 3), wherein the two others market data informs the opening price (MDEntryType = 4) and imbalance (MDEntryType = A).
- The second message points to a new position with a volume of 300 by a price of 30 BRL in the bid size at position 1. Then a shift occurs in the order book in order to insert this line of the book in position 1, and the anterior data was allocated in position 2.
- The third message informs a new position with a volume of 43000 by a price of 26.29 BRL in the offer size at position 2.
- The fourth message shows a new position with a volume of 100 by a price of 26.12 BRL in the bid size at position 3.

The SecurityID (48 = 3809639) is the same in all messages since it is the security within is being monitored.

## 3.2 Hardware

The hardware version was implemented as a three-stage pipeline component, where each stage holds a Finite State Machines (FSM). Two versions of the hardware were developed. The first version has a computation flow similar to the software version, in which the whole message is loaded to a registers bank before starting the decoding process. The second version starts the decoding process while the message content is being buffered.

1128=9 35=X 34=732000 52=20130710124500528 75=20130710 268=3 279=0 269=0 22=8 207=BVMF 48=3809639 83=3					
71135 270=26.46 273=124500524 271=1400 272=20130710 37016=20130710 37017=124500523 37=80142490006 288=					
86 290=1 279=0 269=4 22=8 207=BVMF 48=3809639 83=371136 270=26.46 273=124500524 271=700 272=20130710 2					
86=5 279=0 269=A 22=8 207=BVMF 48=3809639 83=371137 273=124500524 271=700 272=20130710 277=P					
1128=9 35=X 34=732008 52=20130710124501713 75=20130710 268=2 279=0 269=0 22=8 207=BVMF 48=3809639 83=3					
71139 270=30 273=124501709 271=300 272=20130710 37016=20130710 37017=124501709 37=80142490026 288=27 2					
90=1 279=0 269=A 22=8 207=BVMF 48=3809639 83=371140 273=124501709 271=1000 272=20130710 277=P					
1128=9 35=X 34=732038 52=20130710124507454 75=20130710 268=3 279=0 269=1 22=8 207=BVMF 48=3809639 83=3					
71146 270=26.39 273=124507450 271=43000 272=20130710 37016=20130710 37017=124507450 37=80142490081 289=					
=262 290=2 279=0 269=4 22=8 207=BVMF 48=3809639 83=371147 270=26.39 273=124507450 271=1700 272=2013071					
0 286=5 279=0 269=A 22=8 207=BVMF 48=3809639 83=371148 273=124507450 271=41400 272=20130710 277=Q					
1128=9 35=X 34=732040 52=20130710124509961 75=20130710 268=1 279=0 269=0 22=8 207=BVMF 48=3809639 83=3					
71149 270=26.12 273=124509957 271=100 272=20130710 37016=20130710 37017=124509957 37=80142490088 288=9					
8 290=3					
--Book-----					
SecurityID: 3809639					
Bid	Offer				
PosNo	Size	Px	Px	Size	PosNo
1	300	30.00	0.00	1	
2	1400	26.46	26.39	43000	2
3	100	26.12	0.00		3
4		0.00	0.00		4
5		0.00	0.00		5
6		0.00	0.00		6
7		0.00	0.00		7
8		0.00	0.00		8
9		0.00	0.00		9
10		0.00	0.00		10

Figure 8 – Order book output from the software version.

Figure 9 shows a diagram of the second approach, where each FSM is represented by a diagram sub block. The first version has a similar diagram, except that the data bus between the readMessage and the MDIncRefresh\_145 FSM were 1500 bytes instead.

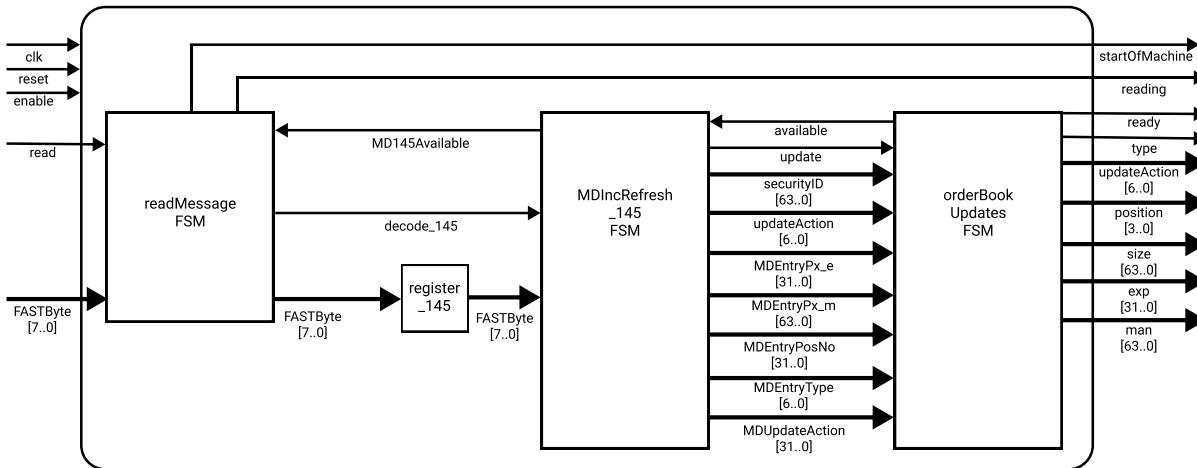


Figure 9 – Top view of the FAST IP version 2. It is a three stage pipeline, where each stage represents a block of the diagram that holds a finite state machine.

In version 1, the readMessage FSM reads the technical header and the FAST message. When the whole message is buffered, it is sent to the decoder machine MDIncRefresh\_145 FSM. It starts to decode field by field and after concluding such operation the commands to update an

order book are sent to the orderBookUpdates FSM. While a message is being decoded, a new message can be read to the buffer in concurrently.

In version 2, the message does not need to be completely buffered before starting the decoding process. It reads the header and starts to send all the read bytes to the decoder, the MDIncRefresh\_145 FSM. When the decoder stage reaches the last stage, it sends the necessary fields to the orderBook machine. While the first version of the hardware consists of a pipeline at granularity of messages, the second one explores pipeline for the internal bytes of the messages.

### 3.2.1 Finite States Machine

This section explains the three FSMs of the hardware. Subsection 3.2.1.1 presents the readMsg FSM, which is responsible for loading the bytes of the FAST message. Subsection 3.2.2 depicted the MDIncRefresh\_145 FSM that receives the bytes from the first FSM to decode the respective fields. Subsection 3.2.3 shows the orderBookUpdates FSM, which receives the fields from the previous stage and generates the update commands for an external order book management system.

#### 3.2.1.1 FSM ReadMessage

The ReadMessage FSM is responsible for receiving the bytes from the input ports and for controlling the second FSM. This FSM diagram is represented in Figure 10. The state transitions occur when MSB is one and a flag named *end field* is set to 1, which means that the concatenation and computation of the field are ready, allowing the machine to move to the next state. The two versions of the hardware are presented simultaneously, and their differences are described in the text.

In version 1, the readMessage FSM reads the ten bytes of the technical header to extract the MsgSeqNum and the MsgLength. A counter increments as the byte is read until it is the same as MsgLength. When the whole message is buffered, the PMap and the TemplateID fields are obtained, and if the TemplateID is 145, the whole message from the buffer is sent to the decoder machine MDIncRefresh\_145 FSM.

In version 2, the message does not need to be completely buffered before starting the decoding process. It reads the 10 bytes technical header and decodes MsgSeqNum and MsgLength from it. Then, decodes the PMap and the TemplateID fields while reading the bytes, and if the TemplateID is 145, it starts to send all the read bytes to the decoder machine, which will be available by the MDIncRefresh\_145 in the next clock cycle. A counter increments as the byte is read until it is the same as MsgLength. Then, the readMachine stops to send the bytes to the decoder stage and starts to read the technical header of the next message. Only at the controlDecoder state, the bytes to be decoded are sent to the decoder machine. The items below detail all the states from readMessage FSM that are depicted in the Figure 10.

- The Wait1 state synchronizes the input of the data since when the external hardware writes a byte, it is only available for the readMsg state in the next clock cycle.
- The readMsg state reads the first ten bytes from the message, then splits and decodes the MsgSeqNum and the MsgLength fields of the unencoded header of the message.
- After, the next state decodes the PMap field, which is necessary for decoding the subsequent fields that depend on the respective bit in the PMap vector.
- The template ID decoder is the following state, which can be acquired from the message stream if the correspondent PMap bit is set to one.
- If the template ID exists and is equal to 145, the block verifies if this template decoder engine is available by checking the flag *MDIncRefresh\_145* and starts to send the following bytes to the decoder FSM in a 1-byte bus width. A counter increment until it becomes the same as the MsgLength value. Then, the machine returns to the Start state to read the next message.

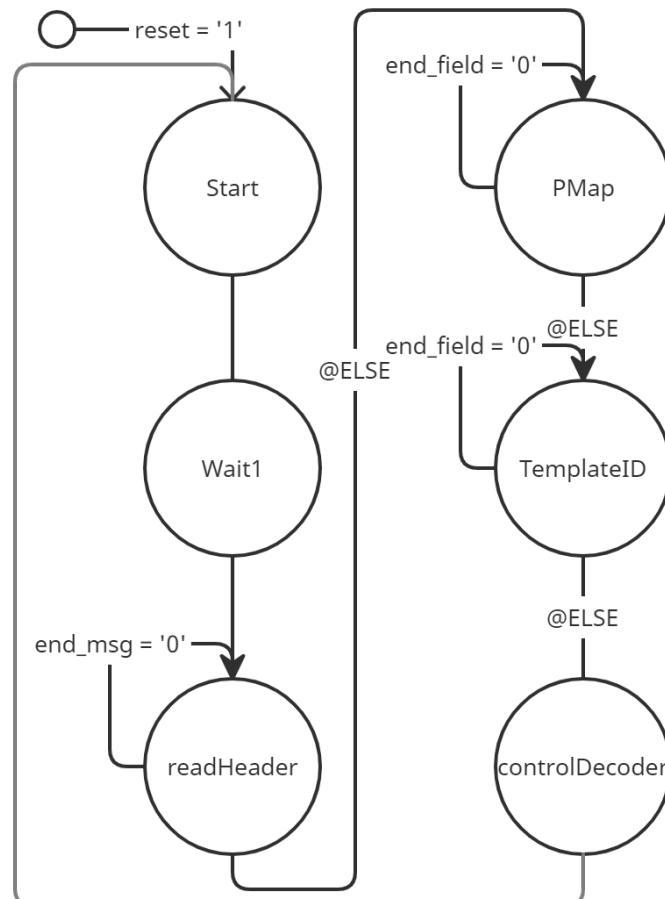


Figure 10 – Version 2 of ReadMessage FSM.

### 3.2.2 **FSM MDIncRefresh\_145**

The MDIncRefresh\_145 FSM is the main part of the hardware, which is responsible to decode a FAST message for the Template 145. The FSM diagram is depicted in Figure 11. Each state identifies a specific field: the MsgSeqNum, the SendingTime, the TradeDate, the NoMDEntries, and the MDSequence. The MDSequence is a group of states which represents the MDEntries sequence. A total of 50 states exist to decode up to 50 possible fields from the messages. For example, to decode a MDEntryPositionNo value, which is an uInt32, optional, with a PMap bit associated (the bit of position 21), with no operator, with any initial value and a nullable field, it executes the algorithm depicted on Figure 12. The state transition table 3 demonstrates all the states from this group, which transition condition is always true when the end\_field flag is equal to 1. In the case of the IndexSeq state, it can have the MEntriesSequence\_MAP as destination state if the sequence counter is less than the NoMDEntries.

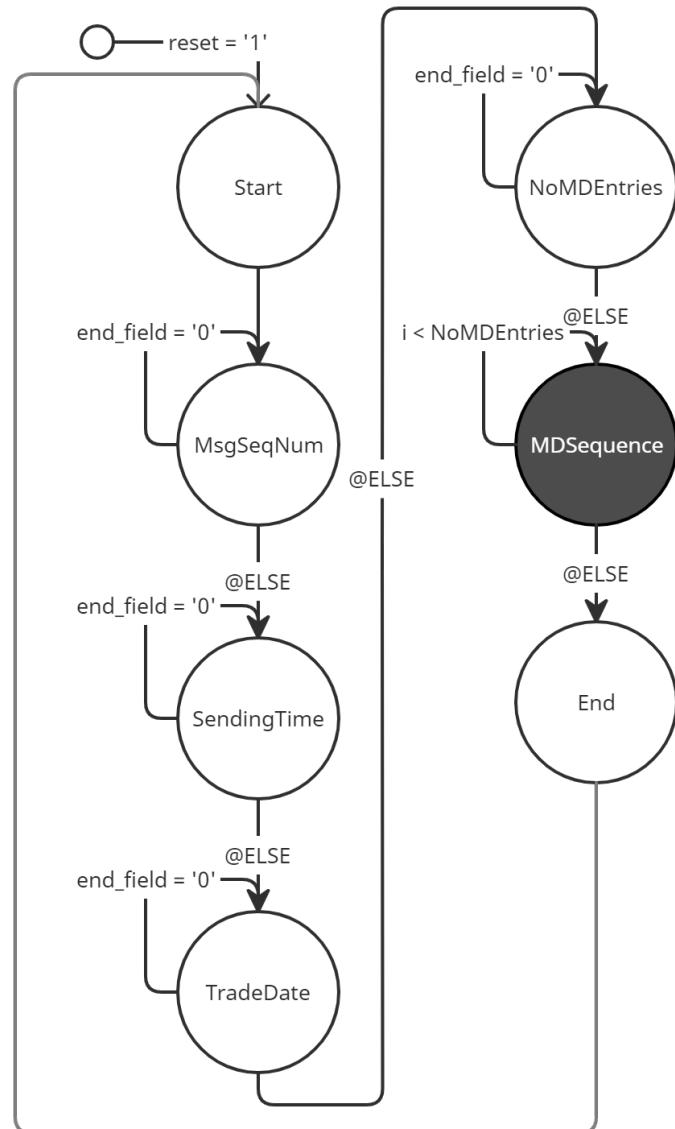


Figure 11 – MDIncRefresh\_145 FSM.

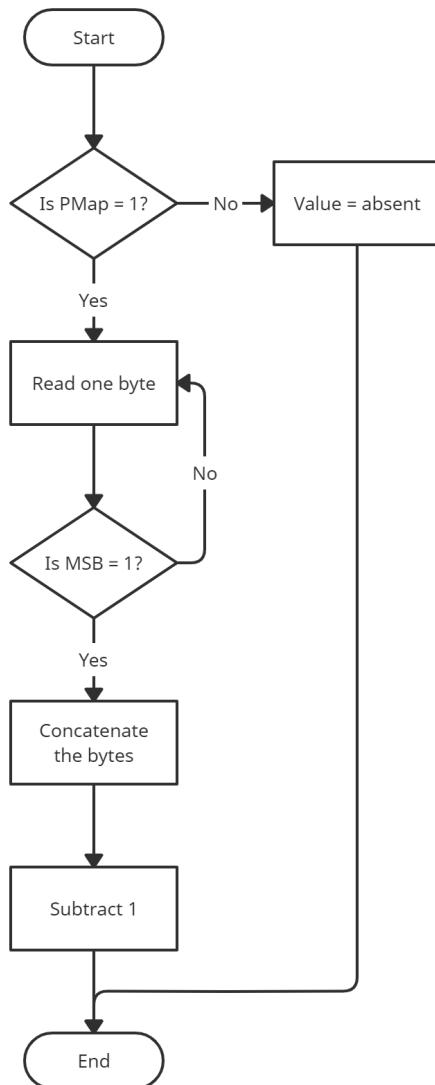
Figure 12 – Flow char of a `uInt32` field decoder.

Table 3 – State transition table of the MDSequence group from the MDIncRefresh\_145. The transition condition is always true when the end field is equal to 1.

Source State	Destination State
MDEntriesSequence_PMAP	MDUpdateAction
MDUpdateAction	MDEntryType
MDEntryType	SecurityID
SecurityID	RptSeq
RptSeq	QuoteCondition
QuoteCondition	MDEntryPx_e
MDEntryPx_e	MDEntryPx_m
MDEntryPx_m	MDEntryInterestRate_e
MDEntryInterestRate_e	MDEntryInterestRate_m
MDEntryInterestRate_m	NumberOfOrders
NumberOfOrders	PriceType
PriceType	MDEntryTime
MDEntryTime	MDEntrySize
MDEntrySize	MDEntryDate
MDEntryDate	MDInsertDate
MDInsertDate	MDInsertTime
MDInsertTime	MDStreamID
MDStreamID	Currency
Currency	NetChgPrevDay_e
NetChgPrevDay_e	NetChgPrevDay_m
NetChgPrevDay_m	SellerDays
SellerDays	TradeVolume
TradeVolume	TickDirection
TickDirection	TradeCondition
TradeCondition	TradingSessionID
TradingSessionID	OpenCloseSettlFlag
OpenCloseSettlFlag	OrderID
OrderID	TradeID
TradeID	MDEntryBuyer
MDEntryBuyer	MDEntrySeller
MDEntrySeller	MDEntryPositionNo
MDEntryPositionNo	SettPriceType
SettPriceType	LastTradeDate
LastTradeDate	PriceAdjustmentMethod
PriceAdjustmentMethod	PriceBandType
PriceBandType	PriceLimitType
PriceLimitType	LowLimitPrice_e
LowLimitPrice_e	LowLimitPrice_m
LowLimitPrice_m	HighLimitPrice_e
HighLimitPrice_e	HighLimitPrice_m
HighLimitPrice_m	TradingReferencePrice_e
TradingReferencePrice_e	TradingReferencePrice_m
TradingReferencePrice_m	PriceBandMidpointPriceType
PriceBandMidpointPriceType	AvgDailyTradedQty
AvgDailyTradedQty	ExpireDate
ExpireDate	EarlyTermination
EarlyTermination	MaxTradeVol
MaxTradeVol	NoUnderlyings
NoUnderlyings	IndexSeq
IndexSeq	End

### 3.2.3 *orderBookUpdates Machine*

The *orderBookUpdates* FSM has the objective to receive the order book fields to produce the necessary commands for an external controller to be able to keep order books updated. This FSM has the following functionalities:

- To verify if the fields are not absent.
- To test if the SecurityID is the one that is being monitored.
- To check if the position of the book is within the size of the book.
- To convert the field *MDEntryType* from char to 1 bit, since the order book uses only the bid and offer values.
- To reduce the field *MDupdateAction* from 32 bits to 7 bits, since all the valid commands of this field is an ASCII character.
- To reduce the field *MDEntryPositionNo* from 32 bits to 4 bits, since the hardware works with an order book with 10 positions.

The output signals implemented for an order book update are correspondents to the tags *MDEntryType*, *MDUpdateAction*, *MDEntryPositionNo*, *MDEntrySize*, and *MDEntryPx* (exponent and mantissa).

## 3.3 VHDL testbench

For hardware validation, a VHDL testbench wraps the FAST IP component to work as a Devide Under Test (DUT) in order to write the FAST log into the IP and build the order book according to its outputs.

The testbench consists of an FSM that starts to write byte by byte to the input port of the DUT only when the control bits *startOfMachine* is 1 and the *reading* is 0. Then, it stays writing while the *reading* output port is 1. As soon as the *ready* output port of the DUT is set to 1, the testbench reads its output ports in order to get the necessary fields to an order book update. Then, it applies the necessary computation for an insert book operation and then executes the necessary shifts to edit the order book options.

Then, a comparison with the results from the software and from the VHDL testbench are conducted. With this, it was possible to see that the order book handled from the software was the same as that from the testbench.

## 3.4 The Hardware Component Interface

This section presents the hardware component interface, such as the ports of the component and the waveforms showing its functionality. The signals available through its interface are listed in Table 4, and the use of each signal is explained below.

- The signal *clk* receives the clock signal.
- The signal *reset* is used to initialize or reset the states and registers in the component.
- The signals *enable* and *read* are inputs used to control the load of the bytes.
- The signal *FASTByte* is a data bus in which the bytes from FAST messages are loaded.
- The signal *reading* is an output port that is read by the external hardware in order to control its writings.
- The *ready* is an output used by the external hardware to control its reading of the order book updates.
- The signals *type*, *updateAction*, *position*, *size*, *exp*, and *man* are data buses used by the external hardware to read the necessary information for order book updates.

Table 4 – The ports of the IP.

Port	Size (bits)	Direction	Type
clk	1	Input	Clock
reset	1	Input	Control
enable	1	Input	Control
read	1	Input	Control
FASTByte	8	Input	Data
startOfMachine	1	Output	Control
reading	1	Output	Control
ready	1	Output	Control
type	1	Output	Data
updateAction	7	Output	Data
position	4	Output	Data
size	64	Output	Data
exp	32	Output	Data
man	64	Output	Data

The numbers of the wave diagram from Figure 13 represents the following:

1. One clock cycle with *reset* pin set to initialize the IP.



Figure 13 – Waveform showing how to write bytes with an external hardware.

2. The input *read* must receive 1 if the output *startOfMachine* is set to 1 and *reading* is set to 0, in order to start the IP to read the bytes. Then, the output *reading* is set to 1, and the *startOfMachine* is set to 0, since the machine started to read the bytes. When the *startOfMachine* returns to 1, the component is ready to receive another message.
3. In the next clock cycles, the external hardware can write the bytes in the component port, always when the *reading* port is 1. This is due to the fact that not every byte is going to be used in the sequence, because if the PMap is 0, the byte is only going to be used in some next state. So, the *reading* is set to 0 in order to inform the external hardware that it is not able to load another byte. When another state is reached, and if it demands the next byte, the pin is set to 1 again.

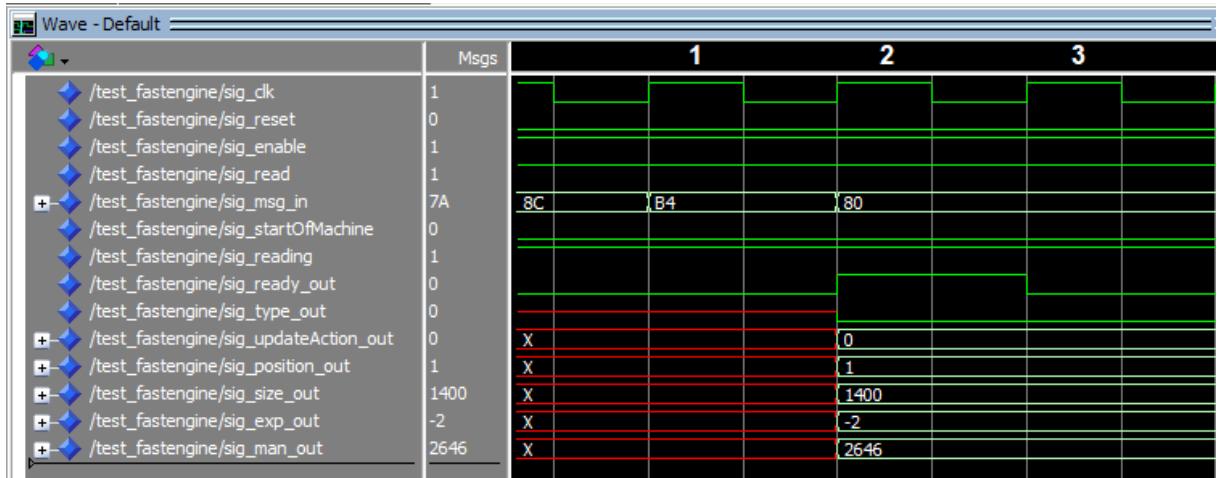


Figure 14 – Waveform showing how to read bytes with an external hardware.

The second clock cycle of the wave diagram from Figure 14 shows how to handle the order book. The wrapped hardware needs to read the *type*, *updateAction*, *position*, *size*, *exp*, and *mant* ports, always when the *ready* port is set. These are the information required to update the order book. When the *ready* is 1, it means that the Security ID, which is the instrument (security) identification code, that is being monitored has some book update. The *updateAction\_out* informs the market data update action, which is from a type *new*. The *type\_out* points that it is a bid insertion.

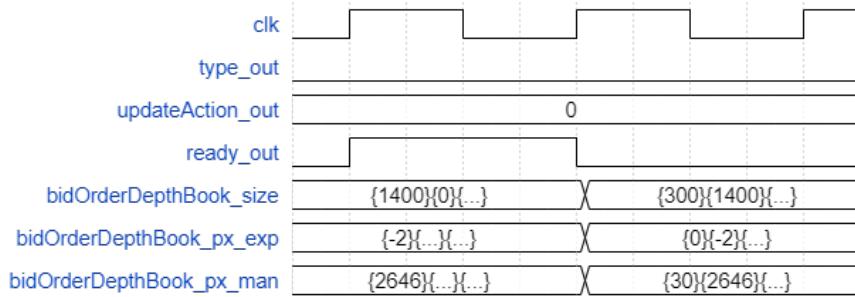


Figure 15 – Waveform diagram showing an order book update.

Figure 15 demonstrates an order book update. The external hardware insert the data in the corresponding position and shift the other positions as necessary. The result of this example is an order book insertion with a new line at position 1 (index 0) of the bid size (*bidOrderDepthBook\_size* signal), adding volume 300 at price BRL 30 (*bidOrderDepthBook\_px\_exp* and *bidOrderDepthBook\_px\_man* signals). Shifting the previous data at this position to position 2 (index 1), as seen in the volume 1400 at price BRL 26.46.

Figure 16 shows a print from ModelSim, which is possible to see an order book built occurring in the wrapped hardware (the VHDL testbench). The highlighted parts show the order book information, such as the size, the exponent of the price, and the mantissa of the price, from up to down, respectively. Note that position 1 of the book has a volume of 300 with the price of

$$10^0 \times 30 = 30$$

Position 2 has a volume of 1400 with a price of 26.46, and position 3 has a volume of 100 for 26.12.

All these three FSMs run in parallel. In the first version of the hardware, while the MDIncRefresh is decoding a single message, the readMessage can be free to read the next one. In the second version, while the MDIncRefresh is processing some byte, the readMessage reads the next one. The FSM MDIncRefresh\_145 can be replaced to implement different templates.

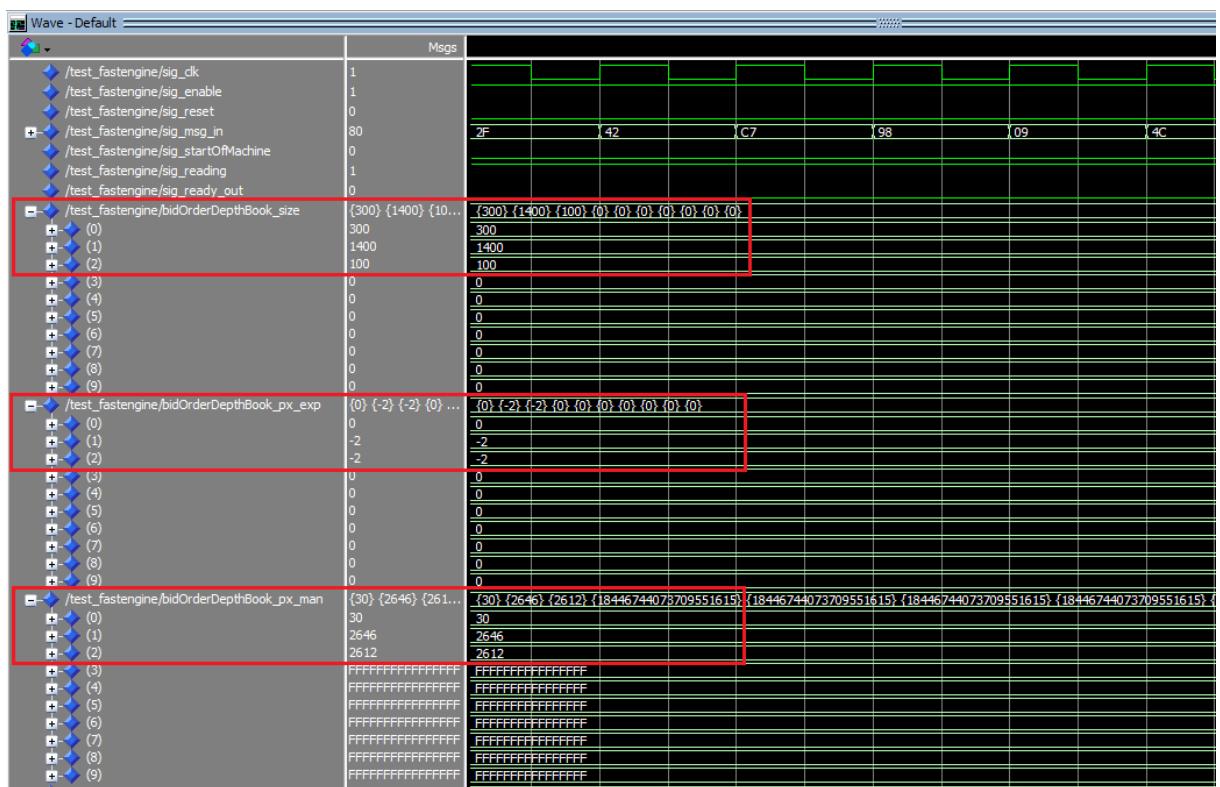
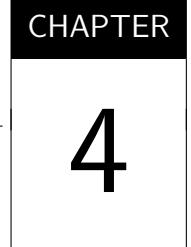


Figure 16 – Waveform diagram showing an order book built.





## RESOURCE UTILIZATION AND EXECUTION RESULTS

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The hardware was synthesized to a Stratix V 5SGXEA7K2F40C2 FPGA using Quartus version 18.1 and its functionality validated in ModelSim tool version 10.5b. The software solution was evaluated in an Intel(R) Xeon(R) CPU E5-1607 3.10 GHz, 32,0 GB of RAM, with Ubuntu 20.04.2.0 LTS.

The first hardware version operates at a clock frequency of 110MHz and its average latency to read, decode and outputs the order book fields is 1.32us per message. The second hardware operates at a clock frequency of 164MHz, with an average latency of 0.72us per message.

A parallel clock counter was used to determine the number of cycles needed to decode two set of logs. The first log has 59 messages, which takes 6997 clock cycles to complete. The latency is calculated by multiplying the number of clock cycles by the period, then divided it by the number of messages. The messages are from 70 to 131 bytes (average of 85 bytes long).

The second log has 500 messages, with a cost of 59865 clock cycles to complete. The Figure 17 shows the relation between the message length in bytes and the number of entries and its latency in clock cycles. It is possible to note that the times are more deterministic, and that there is a relation between the number of entries from a message with the latency. This happens because the hardware passes through all the decoding states, even if the majority does not compute any data because it did not come in the stream. The difference is more significant when comparing the number of entries equal to 1 and the number of entries equal to 2 since, in the second case, the machine will need to go through all decoding states twice. The final latency is not twice as long because there are usually fewer fields present in the second loop, causing the machine to spend fewer cycles per state. When comparing the number of inputs of 2 and 3, the latency difference is less because the machine passes less than the double of times in comparison to the first case. It brings the notion that the difference is more significant

when compared between a few loops and less when the number of loops increases. Figure 18 shows a trend line given by the linear equation 4.1 with a determination coefficient ( $R^2$ ) of 0.981, approximating the relation between message length and latency. The  $R^2$  expresses the variance of the linear model, so the higher the number is, the better it represents the sample. In the example, the linear model contemplates 98.1% of the variance between the variables. The function was obtained by linear regression.

$$\text{latency} = 1.9 * \text{msg\_length} - 44.3. \quad (4.1)$$

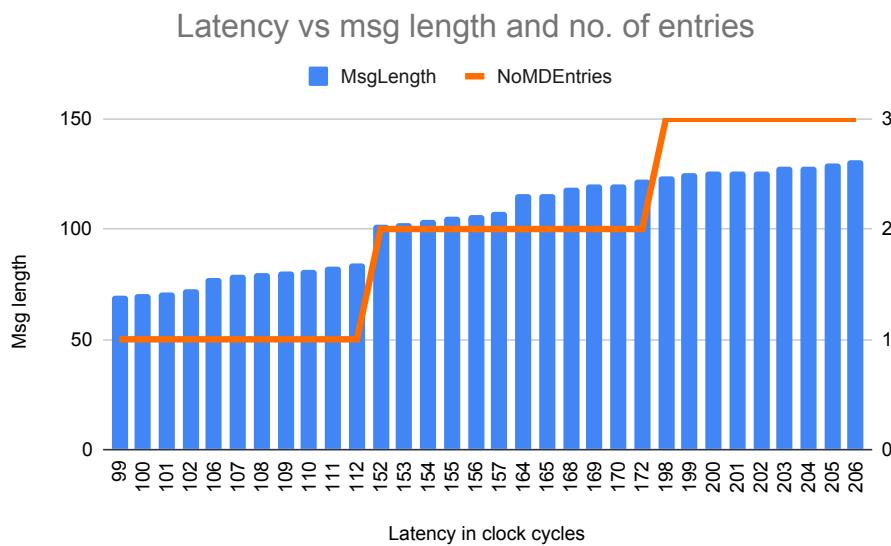


Figure 17 – Relation between latency and message length.

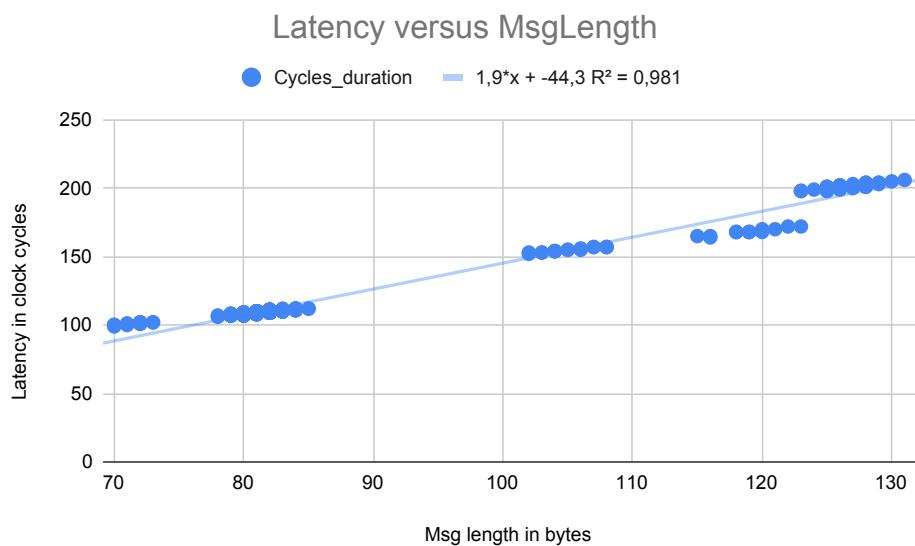


Figure 18 – Trend line between message length and latency.

The software has an average latency of 209us per message, including the input operations necessary to read the bytes from the log file. It was evaluated using the C clock function, measuring 30 times each message of the log and taking its averages. The software was implemented in reason to be used as a golden model, so no parallelization strategy was applied, even if software parallelization strategies are not efficient, according to [Tang \*et al.\* \(2016\)](#).

Figure 19 shows a column chart of the latency classified by message length from the FAST log used by this work. The number of messages of each size demonstrated in axis X are aggregated in each column, which their average latency was calculated, given by axis Y. There is no linear relation between the size of the message and its latency in the software, given to the imprecision of the measurements because of the concurrent processes in the S.O. In the case of the hardware, the latencies are more deterministic.

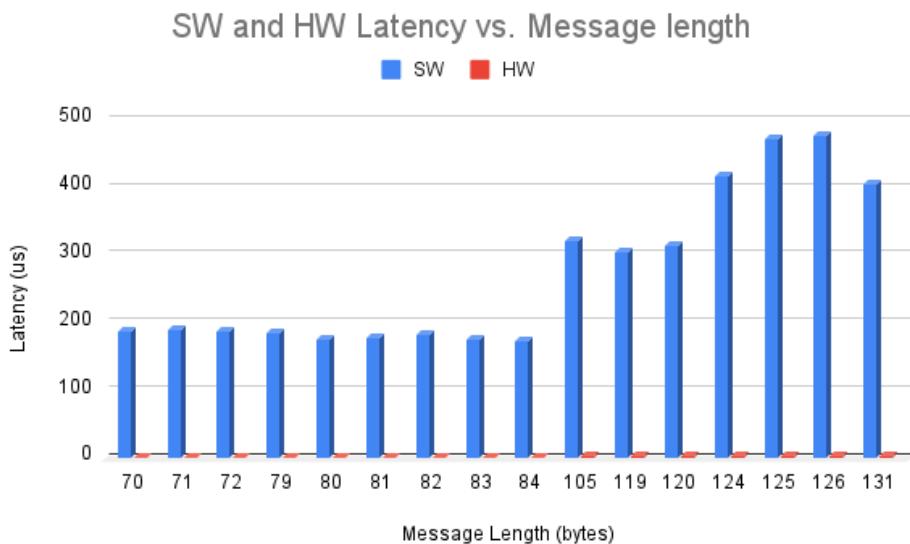


Figure 19 – Relation between the latency and the message length.

Table 5 lists the resources needed to implement both hardware versions. The signals that store the fields in the second hardware were reduced according to the characteristics of the messages of the vendor, which could be seen through the log. It was possible to achieve better performance with fewer recourses used. Another reason for the reduction of the FPGA resources is given by the 1500 bytes bus that was substituted by a 1-byte bus.

It contributes to the idea that designing the hardware with only the necessary attributes needed by the provider can achieve better results. For example, there is no specification of the limit size of a string field, so it is reserved a 50 bytes register for this case. These numbers can be chosen after an analysis of the characteristics of the messages. Without these reductions, version 2 of the hardware has achieved 112MHz with a latency of 0.984us per message.

The work of [Yu, Fu and Liu \(2017\)](#) did it similarly, as its system processes string fields into 16 bytes, since by its study, the length of a string field in FAST is rarely bigger than 16 in

Table 5 – Stratix V FPGA resources used by the hardwares

Resource	Version 1			Version 2		
	Used	Available	Utilization (%)	Used	Available	Utilization (%)
LUT	36133	234720	15	3147	234720	1
FF	13822	-	-	354	-	-
DSP	0	256	0	0	256	0

practical scenarios. [Boutros et al. \(2017\)](#) designed a hardware able to process only the necessary part of the protocol with a self-created template.

This approach prevents that the hardware becomes oversized. Another way to better design the hardware resources is by checking the FAST dictionary. For example, the field MDEntryType is of type string, but the values it can receive, defined by the dictionary, are all one byte length.

A comparison with the related works in Table 6. Compared to our software, with a latency of 209us, a reduction of the latency by two orders of magnitude was possible. Our hardware solution, version 2, has a latency metric similar to the works [Tang et al. \(2016\)](#) and [Leber, Geib and Litz \(2011\)](#). The [Boutros et al. \(2017\)](#) achieves a lower latency due to its own FAST template.

[Lockwood et al. \(2012\)](#) implemented the design on a NetFPGA-10G, with a Xilinx Virtex-5 embedded, and the FPGA resources used are not given in the paper. The messages used for valuation were from 12 to 82 bytes in size.

[Tang et al. \(2016\)](#) used a Xilinx KC705 board, equipped with a Xilinx Kintex-7 XC7K325T. The FPGA resources were 203K Look-up Table (LUT), 407K Flip-Flop (FF), and 804 Digital Signal Processing (DSP). This work implements three templates, with 9, 11, and 21 fields. The resource utilization varies based on the template sizes, varying 1.5% to 3.5% to LUT utilization and about 0.8% to 1.5% to FF. DSP was not used by the design. The hardware achieves 244, 238 and 207MHz, for the templates with the 9, 11, and 21 fields, respectively.

[Boutros et al. \(2017\)](#) utilized an Alpha Data8k5 board, embedded with a Xilinx Kintex Ultrascale XCKU115-2-FLVA1517E. The FPGA resources were 49638 LUT, with 7.48% of utilization, 32718 FF, 2.47%. DSP was not used by the design. Considering its template (2) with the 7 fields and its types and sizes, the maximum of the FAST message of this work is 16 bytes. The system runs at 156MHz.

[Leber, Geib and Litz \(2011\)](#) synthesized the design on a Xilinx Virtex-4 FX100. The hardware consumes 5630 LUT and runs at 160Mhz.

Table 6 – Table of comparison among related works

Work	Latency ( $\mu s$ )	Latency/field (ns)	Design Method	Template No. of fields	Msgs. Sizes (bytes)
(LOCKWOOD <i>et al.</i> , 2012)	0.2	-	Not given in the paper	Not given	18 - 82
(TANG <i>et al.</i> , 2016)	0.5 - 1.3	55 - 61	Vivado HLS	9, 11 and 21	Not given
(BOUTROS <i>et al.</i> , 2017)	0.115	16.4	Vivado HLS 2016.3	7	Max. of 16
(LEBER; GEIB; LITZ, 2011)	2.6	-	RTL	Not given	Not given
This work	0.72	12.2	RTL	59	85 on average

This hardware component is available as open source at <https://github.com/cairossoliveira/FASTEEngine-IP>, which can be expanded to support other templates as well. Most of the construction and optimizations proposed in this work can be reused, which can speed up further developments. Such components are usually provided as commercial solutions. The golden model software can be accessed in <https://github.com/cairossoliveira/FASTEEngineMD>. The hexadecimal FAST and the ASCII FIX logs can be view on Annex B and on Annex C.



CHAPTER  
5

## CONCLUSION

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In this work we have developed a hardware component for the FAST decoder that receives as input FAST messages and generate as output order book updates. The achieved average latency for each message was 0.77us, which is the total time between the input of the bytes and the outputs of the order book fields, for a message to be completely decoded providing the necessary commands to update an order book. The results are equivalent to the related works, and to the best of our knowledge, this work is the first to propose a FAST engine for the B3 template. The proposed component can be associated with other components in order to build an HFT system applied to financial applications.

Although the messages are defined by the FAST protocol, the vendor defines its templates. That is, the vendor defines the order, the quantity, the sizes, the types, the operations of the fields, and its sequences. Such as the sequences as well. Therefore, different templates may demand different computation demanded, affecting the latency to process each message.

Independent of the template, FAST decoding algorithm is highly sequential, since to decode each field in the stream it is necessary to know the content of the previous field ([BOUTROS \*et al.\*, 2017](#)). This data dependency imposes significant limitations to the spatial computation capability provided by FPGAs.

Vide an FPGA-based hardware decoder can provide a considerable speedup when compared to traditional software design. However, implementing all the rules for the templates is a huge time-consuming task due to the complexity of the FAST protocol. It requires many decoders combinations to support the entire protocol, such as decimal field with delta operator, UInt32 with increment operator, UInt32 with copy operator, and suchlike. Accordingly, there is the need to delimitate the scope of a FAST decoder. Therefore, the proposed hardware can process FAST messages with the number of chunks equals to one, with template ID 145 (MDIncRefresh), which defines the necessary fields to update the order book. Despite the high data dependency, with the proposed hardware optimizations for the B3 template, it was possible to achieve an

average latency of 0.78us, with 1.3M of messages per second of throughput.

The main challenge of implementing this work was due to the sizes of the templates from B3. Whereas some templates seen in the literature from others vendors are about 7 fields, the one from B3 has 59 fields. This made it difficult and time-consuming to reach a functional decoder by implementing all the rules and processes that attend each field in the template. Because of this, it was not possible to cover all the FAST templates, and the developed hardware does not allow messages with number of chunks of more than one.

## 5.1 Future Work

For future work, cores with the FAST protocol operations could be implemented, such as a decimal field with delta operator, UInt32 with increment operator, UInt32 with copy operator, and suchlike. With this, the whole design could utilize these cores instead of having the computation hard-coded in each field decoder, as did by [Boutros et al. \(2017\)](#). With these cores, different fields can be decoded by a same core if these have the same decoding algorithm, which is given by the data type and the operation. With the decoding algorithm hard-coded, similar processes are implemented directly in the decodification of each field, which ampliates the use of the hardware resources to execute the necessary computation. This approach can contribute to the reuse of these cores for the implementation of new templates, such as for the maintenance and for the necessary modifications in case of changes in the template. In others works, automated generators of hardware decoders from the XML templates were also implemented, as seen in [Tang et al. \(2016\)](#).

The approach above can also be applied in the golden model software, which currently consists of more isolated processing functions in its organization. For example, if a UInt32 field with a copy operator is going to be decoded, firstly, an integer decoder is called, and then a copy operator function is called. An organization with these operations united could make the debugger and modifications easier and make the software more modular.

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ANNEX

A

## TEMPLATE 145

---



---

```

1 <template name="MDIncRefresh_145" id="145" dictionary="145" xmlns="http://
  www.fixprotocol.org/ns/fast/td/1.1">
2   <!--desc="Previous version was 138"-->
3   <string name="ApplVerID" id="1128">
4     <constant value="9"/>
5   </string>
6   <string name="MsgType" id="35">
7     <constant value="X"/>
8   </string>
9   <uInt32 name="MsgSeqNum" id="34"/>
10  <uInt64 name="SendingTime" id="52"/>
11  <uInt32 name="TradeDate" id="75" presence="optional"/>
12  <sequence name="MDEntries">
13    <length name="NoMDEntries" id="268"/>
14    <uInt32 name="MDUpdateAction" id="279">
15      <copy value="1"/>
16    </uInt32>
17    <string name="MDEntryType" id="269">
18      <copy value="0"/>
19    </string>
20    <uInt32 name="SecurityIDSource" id="22">
21      <constant value="8"/>
22    </uInt32>
23    <string name="SecurityExchange" id="207">
24      <constant value="BVMF"/>
25    </string>
26    <uInt64 name="SecurityID" id="48">
27      <copy/>
28    </uInt64>
29    <uInt32 name="RptSeq" id="83">
30      <increment/>
31    </uInt32>
```

```
32     <string name="QuoteCondition" id="276" presence="optional">
33         <default/>
34     </string>
35     <decimal name="MDEntryPx" id="270" presence="optional">
36         <exponent>
37             <default value="-2"/>
38         </exponent>
39         <mantissa>
40             <delta/>
41         </mantissa>
42     </decimal>
43     <decimal name="MDEntryInterestRate" id="37014" presence="optional">
44         <exponent>
45             <default value="-2"/>
46         </exponent>
47         <mantissa>
48             <delta/>
49         </mantissa>
50     </decimal>
51     <uInt32 name="NumberOfOrders" id="346" presence="optional">
52         <default/>
53     </uInt32>
54     <string name="PriceType" id="423" presence="optional"/>
55     <uInt32 name="MDEntryTime" id="273">
56         <copy/>
57     </uInt32>
58     <int64 name="MDEntrySize" id="271" presence="optional">
59         <delta/>
60     </int64>
61     <uInt32 name="MDEntryDate" id="272" presence="optional">
62         <copy/>
63     </uInt32>
64     <uInt32 name="MDInsertDate" id="37016" presence="optional">
65         <copy/>
66     </uInt32>
67     <uInt32 name="MDInsertTime" id="37017" presence="optional">
68         <copy/>
69     </uInt32>
70     <string name="MDStreamID" id="1500" presence="optional">
71         <default/>
72     </string>
73     <string name="Currency" id="15" presence="optional">
74         <copy/>
75     </string>
76     <decimal name="NetChgPrevDay" id="451" presence="optional">
77         <exponent>
78             <default/>
```

```
79      </exponent>
80      <mantissa>
81          <delta/>
82      </mantissa>
83  </decimal>
84  <UInt32 name="SellerDays" id="287" presence="optional">
85      <default/>
86  </UInt32>
87  <UInt64 name="TradeVolume" id="1020" presence="optional">
88      <delta/>
89  </UInt64>
90  <string name="TickDirection" id="274" presence="optional">
91      <default/>
92  </string>
93  <string name="TradeCondition" id="277" presence="optional">
94  </string>
95  <UInt32 name="TradingSessionID" id="336" presence="optional">
96  </UInt32>
97  <UInt32 name="OpenCloseSettlFlag" id="286" presence="optional">
98  </UInt32>
99  <string name="OrderID" id="37" presence="optional">
100     <default/>
101  </string>
102  <string name="TradeID" id="1003" presence="optional">
103      <default/>
104  </string>
105  <string name="MDEntryBuyer" id="288" presence="optional">
106      <default/>
107  </string>
108  <string name="MDEntrySeller" id="289" presence="optional">
109      <default/>
110  </string>
111  <UInt32 name="MDEntryPositionNo" id="290" presence="optional">
112      <default/>
113  </UInt32>
114  <UInt32 name="SettPriceType" id="731" presence="optional">
115  </UInt32>
116  <UInt32 name="LastTradeDate" id="9325" presence="optional">
117  </UInt32>
118  <UInt32 name="PriceAdjustmentMethod" id="37013" presence="optional">
119  </UInt32>
120  <string name="PriceBandType" id="6939" presence="optional">
121      <default/>
122  </string>
123  <UInt32 name="PriceLimitType" id="1306" presence="optional">
124      <default/>
125  </UInt32>
```

```
126    <decimal name="LowLimitPrice" id="1148" presence="optional">
127        <exponent>
128            <default/>
129        </exponent>
130        <mantissa>
131            <delta/>
132        </mantissa>
133    </decimal>
134    <decimal name="HighLimitPrice" id="1149" presence="optional">
135        <exponent>
136            <default/>
137        </exponent>
138        <mantissa>
139            <delta/>
140        </mantissa>
141    </decimal>
142    <decimal name="TradingReferencePrice" id="1150" presence="optional">
143        <exponent>
144            <default/>
145        </exponent>
146        <mantissa>
147            <delta/>
148        </mantissa>
149    </decimal>
150    <uInt32 name="PriceBandMidpointPriceType" id="37008" presence="optional">
151    </uInt32>
152    <uInt64 name="AvgDailyTradedQty" id="37003" presence="optional">
153    </uInt64>
154    <uInt64 name="ExpireDate" id="432" presence="optional">
155    </uInt64>
156    <uInt64 name="EarlyTermination" id="37019" presence="optional">
157    </uInt64>
158    <uInt64 name="MaxTradeVol" id="1140" presence="optional">
159    </uInt64>
160
161    <sequence name="Underlyings" presence="optional">
162        <length name="NoUnderlyings" id="711"/>
163        <uInt64 name="UnderlyingSecurityID" id="309">
164            <delta/>
165        </uInt64>
166        <uInt32 name="UnderlyingSecurityIDSource" id="305">
167            <constant value="8"/>
168        </uInt32>
169        <string name="UnderlyingSecurityExchange" id="308">
170            <constant value="BVMF"/>
171        </string>
```

---

```
172     <decimal name="UnderlyingPx" id="810">
173         <exponent>
174             <default value="-2"/>
175         </exponent>
176         <mantissa>
177             <delta/>
178         </mantissa>
179     </decimal>
180     <uInt32 name="UnderlyingPxType" id="37018" presence="optional">
181         </uInt32>
182     </sequence>
183
184     <uInt64 name="IndexSeq" id="37100" presence="optional">
185         </uInt64>
186     </sequence>
187 </template>
```

---

Source: Extracted from the B3 FAST template.



**ANNEX****B**

---

**FAST LOG**

---

000B2B31000100010046C001912C56B1236118630F5515E2094C5795815B300AC08201680AF  
D0379E98080803A535DDF80094C579780808038303134303630353330B6B3CB8080808080  
80808080000B2B32000100010047C001912C56B2236118630F5515ED094C5795817B3009C  
082B1016823DC031FDC8080803A535DEA80094C579780808038303134313933383638B9B3  
C08080808080808080000B2B33000100010046C001912C56B3236118630F551CFE094C5  
792815B300AC082016D71E803FE8080803A5364FB80094C5797808080803830313338323937  
3830B133B78280808080808080000B2B3D000100010048C001912C56BD236118630F6  
F78F1094C5792815B300AC082016816AB0433FA8080803A6E40ED80094C5797808080803830  
3133383430393336B23338B68280808080808080000B2B40000100010048C001912C5  
6C0236118630F7A0FC8094C578E817B3009C082B1016823DC031FDD8080803A7857C380094C  
579780808038303133323938383631B532B1B18080808080808080000B2B470001000  
10046C001912C56C723611863100D4DEB094C5792815B300AC082016842E71653BD8080803B  
0C15E680094C579780808038303134303439333835B1B3998080808080808080000B2  
B52000100010047C001912C56D223611863102C24C2094C5792815B300AC082016842F60442  
B08080803B2A6CBE80094C579780808038303133393838313035B732B1F1808080808080  
0808080000B2B5D000100010052C001912C56DD23611863103029D5094C579781793C09C080  
B101681689076DCF0AA380803B2E71D11FA1094C5797094C57973B2E71D2808080803830313  
4323438393939B133B9828080808080808080000B2B5E000100010051C001912C56DE23  
61186310302B9F094C579781593C0AC08001680AFD0379EA04A380803B2E739A03F5094C579  
7094C57973B2E739B80808080383031343234393030B138B682808080808080808000  
0B2B5F000100010052C001912C56DF2361186310302BAA094C579781793C09C080B1016842E  
71653BE15B580803B2E73A608CD094C5797094C57973B2E73A7808080803830313432343930  
3030B238B6B1808080808080808080000B2B6000010001007DC001912C56E023611863103  
02CB0094C579783593C0AC080016842E71653BF14D680803B2E74AC0AF9094C5797094C5797  
3B2E74AC80808080383031343234393030B638B6828080808080808080218CB480808  
07AC480808080868080808080808080A3C18080808180D0808080808080808080808080  
80000B2B6100010001007EC001912C56E12361186310302E9D094C579783593C0AC08001682  
3DC031FDE019B80803B2E769905BD094C5797094C57973B2E76998080808038303134323439

303030B938B6828080808080808080218CB4FF80808180808080868080808080808  
08080A3C18080800111A980D1808080808080808080000B2B62000100010051C00191  
2C56E22361186310302F9D094C579781593C0AC080016816AB0433FB0CBC80803B2E7799078  
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808080000B2B63000100010052C001912C56E32361186310302FF4094C579781793C09C080B  
1016816AB0433FC0CD680803B2E77F00785094C5797094C57973B2E77F18080808038303134  
323439303031B538B68280808080808080000B2B64000100010052C001912C56E4236  
11863103033F9094C579781793C09C080B1016842E71653C2158B80803B2E7BF507E9094C57  
97094C57973B2E7BF580808038303134323439303031B938B6948080808080808080800  
00B2B6500010001004FC001912C56E5236118631030348F094C5797815B3C0AC08001682AC8  
6FC2FFA380803B2E7C8B17B9094C5797094C57973B2E7C8C808080803830313432343930303  
2B0B48B8080808080808080000B2B6600010001004FC001912C56E623611863103034E2  
094C5797815B3C0AC08001682AC86FC3FFA280803B2E7CDE17B9094C5797094C57973B2E7CD  
F8080808038303134323439303032B2B48C80808080808080000B2B67000100010050  
C001912C56E72361186310303591094C579781593C0AC08001682AC86FC4038780803B2E7D8  
D05BD094C5797094C57973B2E7D8E8080808303134323439303032B331B08280808080  
8080808080000B2B68000100010069C001912C56E823611863103035D1094C5797825B3C0AC  
080016842E71653C3819E80803B2E7DCD02AD094C5797094C57973B2E7DCE80808080383031  
34323439303032B632B78280808080808080238CC180808005BD808080D0808080808  
0808080808080000B2B69000100010078C001912C56E92361186310303A85094C5792825B  
300AC082016842F60442B18080803B2F028180094C57978080808038303134303430303034B  
532B7B08080808080808080430C0AC080FF00C18080011CA1094C57973B2F0282808080  
8038303134323439303032B932B7898080808080808080000B2B6A000100010077C0019  
12C56EA2361186310303ADE094C5792825B300AC082016842F60442B38080803B2F02D98009  
4C57978080808038303134303430333235B432B7B18080808080808080430C0AC080FF0  
0C180802DA9094C57973B2F02DA8080808303134323439303033B032B78A808080808080  
80808080000B2B6B000100010051C001912C56EB2361186310303AF6094C579781593C0AC08  
0016823DC031FE1019880803B2F02F200E5094C5797094C57973B2F02F38080808038303134  
323439303033B132B78380808080808080000B2B6C000100010051C001912C56EC236  
1186310303BD0094C579781593C0AC08001680AFD0379EB049F80803B2F03CC00E5094C5797  
094C57973B2F03CC8080808303134323439303033B232B7848080808080808080000  
B2B6D000100010077C001912C56ED2361186310303BE8094C5792825B300AC082016842F604  
42B58080803B2F03E480094C57978080808303134303430353833B632B7B280808080808  
080808080430C0AC080FF00C1808021CD094C57973B2F03E580808080383031343234393030  
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3B2F03F18080808038303134323439303033B43132B9878080808080808080000B2B6F0  
00100010052C001912C56EF2361186310303FE7094C5797815B3C0AC080016842E71653C5FF  
028380803B2F07E302AD094C5797094C57973B2F07E48080808038303134323439303033B73  
2B7938080808080808080000B2B70000100010051C001912C56F0236118631030418709  
4C579781593C0AC08001681689076DD009BC80803B2F098304D9094C5797094C57973B2F098  
48080808038303134323439303033B837B7AB8080808080808080000B2B710001000100

51C001912C56F12361186310304488094C5797815B3C0AC080016842E71653C6819A80803B2  
F0C8402AD094C5797094C57973B2F0C8480808038303134323439303034B237B78F808080  
8080808080000B2B72000100010050C001912C56F2236118631030479D094C5797815B3  
C0AC080017423BA5C9AFF01FF80803B2F0F998B094C5797094C57973B2F0F9A8080803830  
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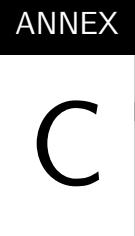
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## FIX LOG

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1128=9|35=X|34=732017|52=20130710124503560|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371142|270=26|273=124503556|271=300|272=20130710|  
37016=20130710|37017=124503555|37=80142490042|288=77|290=14|

1128=9|35=X|34=732018|52=20130710124503965|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11802|270=25.5|273=124503961|271=10|272=20130710|  
37016=20130710|37017=124503961|37=80142490044|288=27|290=18|

1128=9|35=X|34=732019|52=20130710124503972|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64748|270=5.4|273=124503968|271=1100|272=20130710|

37016=20130710|37017=124503968|37=80142490045|288=77|290=8|

1128=9|35=X|34=732020|52=20130710124504159|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371143|270=27.89|273=124504155|271=4300|272=20130  
 710|37016=20130710|37017=124504154|37=80142490050|289=386|290=82|

1128=9|35=X|34=732021|52=20130710124504322|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371144|270=26|273=124504318|271=100|272=20130710|  
 37016=20130710|37017=124504317|37=80142490053|288=27|290=15|

1128=9|35=X|34=732022|52=20130710124504636|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11803|270=27.3|273=124504632|271=50|272=20130710|  
 37016=20130710|37017=124504632|37=80142490058|289=262|290=5|

1128=9|35=X|34=732023|52=20130710124504754|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64749|270=5.34|273=124504750|271=1600|272=2013071  
 0|37016=20130710|37017=124504750|37=80142490060|288=386|290=11|

1128=9|35=X|34=732024|52=20130710124504770|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803947|83=72189|270=14.8|273=124504766|271=1200|272=2013071  
 0|37016=20130710|37017=124504765|37=80142490061|288=386|290=6|

1128=9|35=X|34=732025|52=20130710124504958|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803889|83=11196|270=10.87|273=124504954|271=600|272=2013071  
 0|37016=20130710|37017=124504954|37=80142490062|288=262|290=7|

1128=9|35=X|34=732026|52=20130710124504962|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128721|270=13.29|273=124504958|271=100|272=201307  
 10|37016=20130710|37017=124504958|37=80142490063|289=386|290=2|

1128=9|35=X|34=732027|52=20130710124504963|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128722|270=12.35|273=124504959|271=600|272=201307  
 10|37016=20130710|37017=124504958|37=80142490064|288=262|290=31|

1128=9|35=X|34=732028|52=20130710124504967|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803947|83=72190|270=15.42|273=124504963|271=500|272=2013071  
 0|37016=20130710|37017=124504963|37=80142490065|288=262|290=4|

1128=9|35=X|34=732029|52=20130710124504968|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11804|270=26.01|273=124504964|271=20|272=20130710|  
 37016=20130710|37017=124504964|37=80142490066|289=386|290=1|279=0|269=4|22=  
 8|207=BVMF|48=4002234|83=11805|270=26.01|273=124504964|271=10|272=20130710|  
 286=5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11806|273=124504964|271=10|27  
 2=20130710|277=Q|

1128=9|35=X|34=732030|52=20130710124504969|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128723|270=13.97|273=124504965|271=200|272=201307  
 10|37016=20130710|37017=124504965|37=80142490067|289=386|290=34|

1128=9|35=X|34=732031|52=20130710124504975|75=20130710|268=1|279=0|269=1|22

=8|207=BVMF|48=3802493|83=64750|270=5.5|273=124504971|271=2000|272=20130710|37016=20130710|37017=124504971|37=80142490068|289=386|290=1|

1128=9|35=X|34=732032|52=20130710124505158|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3806536|83=14277|270=3.66|273=124505154|271=1900|272=20130710|37016=20130710|37017=124505153|37=80142490070|288=262|290=7|

1128=9|35=X|34=732033|52=20130710124505253|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3809688|83=237537|270=26.99|273=124505249|271=300|272=20130710|37016=20130710|37017=124505249|37=80142490071|288=262|290=8|

1128=9|35=X|34=732034|52=20130710124505453|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3806536|83=14278|270=3.85|273=124505449|271=2600|272=20130710|37016=20130710|37017=124505449|37=80142490073|288=262|290=2|

1128=9|35=X|34=732035|52=20130710124505568|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3802493|83=64751|270=4.21|273=124505564|271=800|272=20130710|37016=20130710|37017=124505564|37=80142490074|288=27|290=93|

1128=9|35=X|34=732036|52=20130710124505745|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3997293|83=2828|270=6.49|273=124505741|271=20|272=20130710|37016=20130710|37017=124505741|37=80142490077|288=386|290=1|

1128=9|35=X|34=732037|52=20130710124505771|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3809639|83=371145|270=21.22|273=124505767|271=200|272=20130710|37016=20130710|37017=124505767|37=80142490078|288=27|290=232|

1128=9|35=X|34=732038|52=20130710124507454|75=20130710|268=3|279=0|269=1|22=8|207=BVMF|48=3809639|83=371146|270=26.39|273=124507450|271=43000|272=20130710|37016=20130710|37017=124507450|37=80142490081|289=262|290=2|279=0|269=4|22=8|207=BVMF|48=3809639|83=371147|270=26.39|273=124507450|271=1700|272=20130710|286=5|279=0|269=A|22=8|207=BVMF|48=3809639|83=371148|273=124507450|271=41400|272=20130710|277=Q|

1128=9|35=X|34=732039|52=20130710124509946|75=20130710|268=1|279=0|269=1|22=8|207=BVMF|48=3809654|83=74039|270=7.1|273=124509942|271=1000|272=20130710|37016=20130710|37017=124509942|37=80142490087|289=98|290=37|

1128=9|35=X|34=732040|52=20130710124509961|75=20130710|268=1|279=0|269=0|22=8|207=BVMF|48=3809639|83=371149|270=26.12|273=124509957|271=100|272=20130710|37016=20130710|37017=124509957|37=80142490088|288=98|290=3|

1128=9|35=X|34=732041|52=20130710124510070|75=20130710|268=1|279=0|269=1|22=8|207=BVMF|48=3802493|83=64752|270=5.65|273=124510066|271=500|272=20130710|37016=20130710|37017=124510066|37=80142490089|289=98|290=4|

1128=9|35=X|34=732042|52=20130710124510088|75=20130710|268=1|279=0|269=1|22=8|207=BVMF|48=3802493|83=64753|270=5.79|273=124510084|271=11300|272=20130710|37016=20130710|37017=124510084|37=80142490090|289=98|290=8|

1128=9|35=X|34=732043|52=20130710124510102|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74040|270=6.58|273=124510098|271=500|272=20130710|  
 37016=20130710|37017=124510098|37=80142490091|288=98|290=1|

1128=9|35=X|34=732044|52=20130710124510195|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3897576|83=511|270=11.9|273=124510191|271=30|272=20130710|37  
 016=20130710|37017=124510191|37=80142490092|289=98|290=1|

1128=9|35=X|34=732045|52=20130710124510258|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3997293|83=2829|270=7.21|273=124510254|271=13|272=20130710|3  
 7016=20130710|37017=124510254|37=80142490093|289=98|290=3|

1128=9|35=X|34=732046|52=20130710124510273|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3940368|83=793|270=2|273=124510269|271=15|272=20130710|37016  
 =20130710|37017=124510269|37=80142490094|289=98|290=5|

1128=9|35=X|34=732047|52=20130710124510350|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371150|270=31.5|273=124510346|271=3000|272=201307  
 10|37016=20130710|37017=124510345|37=80142490095|289=77|290=339|

1128=9|35=X|34=732048|52=20130710124510539|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3897741|83=4784|270=12.85|273=124510535|271=23|272=20130710|  
 37016=20130710|37017=124510535|37=80142490096|288=98|290=2|

1128=9|35=X|34=732049|52=20130710124511742|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3809688|83=237538|270=31|273=124511737|271=100|272=20130710|  
 37016=20130710|37017=124511737|37=80142490101|288=386|290=1279=0|269=4|22=  
 8|207=BVMF|48=3809688|83=237539|270=29.45|273=124511737|271=100|272=2013071  
 0|286=5|279=0|269=A|22=8|207=BVMF|48=3809688|83=237540|273=124511737|271=19  
 00|272=20130710|277=Q|

1128=9|35=X|34=732050|52=20130710124511874|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371151|270=24|273=124511869|271=100|272=20130710|  
 37016=20130710|37017=124511869|37=80142490102|289=386|290=1|279=0|269=A|22=  
 8|207=BVMF|48=3809639|83=371152|273=124511869|271=41500|272=20130710|277=Q|

1128=9|35=X|34=732051|52=20130710124511892|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371153|270=31.6|273=124511888|271=3000|272=201307  
 10|37016=20130710|37017=124511887|37=80142490103|289=77|290=344|

1128=9|35=X|34=732052|52=20130710124512246|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803889|83=11197|270=11.24|273=124512241|271=200|272=2013071  
 0|37016=20130710|37017=124512241|37=80142490104|288=262|290=3|

1128=9|35=X|34=732053|52=20130710124512250|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803889|83=11198|270=11.14|273=124512246|271=200|272=2013071  
 0|37016=20130710|37017=124512246|37=80142490105|288=262|290=4|

1128=9|35=X|34=732054|52=20130710124512255|75=20130710|268=1|279=0|269=0|22

=8|207=BVMF|48=3803889|83=11199|270=11.04|273=124512251|271=200|272=2013071  
0|37016=20130710|37017=124512251|37=80142490106|288=262|290=5|  
  
 1128=9|35=X|34=732055|52=20130710124512259|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803889|83=11200|270=10.93|273=124512255|271=200|272=2013071  
0|37016=20130710|37017=124512255|37=80142490107|288=262|290=10|  
  
 1128=9|35=X|34=732056|52=20130710124512264|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803889|83=11201|270=10.83|273=124512260|271=200|272=2013071  
0|37016=20130710|37017=124512260|37=80142490108|288=262|290=12|  
  
 1128=9|35=X|34=732057|52=20130710124512269|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803947|83=72191|270=15.82|273=124512265|271=800|272=2013071  
0|37016=20130710|37017=124512265|37=80142490109|288=262|290=21|  
  
 1128=9|35=X|34=732058|52=20130710124512275|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803947|83=72192|270=15.69|273=124512271|271=800|272=2013071  
0|37016=20130710|37017=124512271|37=80142490110|288=262|290=31|  
  
 1128=9|35=X|34=732059|52=20130710124512281|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803947|83=72193|270=15.55|273=124512277|271=800|272=2013071  
0|37016=20130710|37017=124512277|37=80142490111|288=262|290=51|  
  
 1128=9|35=X|34=732060|52=20130710124512286|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803947|83=72194|270=15.42|273=124512282|271=800|272=2013071  
0|37016=20130710|37017=124512282|37=80142490112|288=262|290=81|  
  
 1128=9|35=X|34=732061|52=20130710124512291|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803947|83=72195|270=15.29|273=124512287|271=800|272=2013071  
0|37016=20130710|37017=124512286|37=80142490113|288=262|290=10|  
  
 1128=9|35=X|34=732062|52=20130710124512710|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3806536|83=14279|270=4.01|273=124512706|271=500|272=20130710|  
37016=20130710|37017=124512706|37=80142490115|288=262|290=11|  
  
 1128=9|35=X|34=732063|52=20130710124512710|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3806536|83=14280|270=3.96|273=124512706|271=500|272=20130710|  
37016=20130710|37017=124512706|37=80142490116|288=262|290=21|  
  
 1128=9|35=X|34=732064|52=20130710124512710|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3806536|83=14281|270=3.91|273=124512706|271=500|272=20130710|  
37016=20130710|37017=124512706|37=80142490117|288=262|290=41|  
  
 1128=9|35=X|34=732065|52=20130710124512711|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3806536|83=14282|270=3.85|273=124512706|271=500|272=20130710|  
37016=20130710|37017=124512706|37=80142490118|288=262|290=61|  
  
 1128=9|35=X|34=732066|52=20130710124512711|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3806536|83=14283|270=3.8|273=124512707|271=500|272=20130710|  
37016=20130710|37017=124512706|37=80142490119|288=262|290=71|

1128=9|35=X|34=732067|52=20130710124513554|75=20130703|268=1|279=2|269=1|22  
 =8|207=BVMF|48=3997293|83=2830|273=124513550|272=20130710|37=80136293151|28  
 9=147|290=16|279=0|269=1|22=8|207=BVMF|48=3997293|83=2831|270=9.6|273=12451  
 3550|271=20|272=20130710|37016=20130710|37017=124513550|37=80142490120|289=  
 147|290=25|

1128=9|35=X|34=732068|52=20130710124516655|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53219|270=1.87|273=124516651|271=300|272=20130710|  
 37016=20130710|37017=124516651|37=80142490121|289=27|290=74|

1128=9|35=X|34=732069|52=20130710124516875|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53220|270=1.77|273=124516871|271=300|272=20130710|  
 37016=20130710|37017=124516871|37=80142490122|289=27|290=49|

1128=9|35=X|34=732070|52=20130710124518483|75=20130701|268=2|279=2|269=1|22  
 =8|207=BVMF|48=3802964|83=115|273=124518479|272=20130710|37=80132847443|289  
 =3|290=1|279=0|269=1|22=8|207=BVMF|48=3802964|83=116|270=8.5|273=124518479|  
 271=2200|272=20130710|37016=20130710|37017=124518479|37=80142490124|289=3|2  
 90=1|

1128=9|35=X|34=732071|52=20130710124518486|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3891223|83=63|270=14.75|273=124518482|271=65|272=20130710|37  
 016=20130710|37017=124518481|37=80142490125|289=3|290=1|

1128=9|35=X|34=732072|52=20130710124518492|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74041|270=6.18|273=124518488|271=500|272=20130710|  
 37016=20130710|37017=124518488|37=80142490126|288=3|290=35|

1128=9|35=X|34=732073|52=20130710124518494|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74042|270=6|273=124518490|271=4000|272=20130710|3  
 7016=20130710|37017=124518490|37=80142490127|288=3|290=55|

1128=9|35=X|34=732074|52=20130710124518495|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3955960|83=34|270=16.5|273=124518491|271=10|272=20130710|37  
 016=20130710|37017=124518490|37=80142490128|288=3|290=1|

1128=9|35=X|34=732075|52=20130710124518495|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803533|83=97|270=14.7|273=124518491|271=200|272=20130710|37  
 016=20130710|37017=124518491|37=80142490129|289=3|290=1|

1128=9|35=X|34=732076|52=20130710124518502|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74043|270=6.52|273=124518498|271=1000|272=2013071  
 0|37016=20130710|37017=124518498|37=80142490130|288=3|290=3|

1128=9|35=X|34=732077|52=20130710124518504|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74044|270=6.55|273=124518500|271=1000|272=2013071  
 0|37016=20130710|37017=124518499|37=80142490131|288=3|290=2|

1128=9|35=X|34=732078|52=20130710124518512|75=20130710|268=3|279=0|269=0|22

=8|207=BVMF|48=3809654|83=74045|270=7|273=124518508|271=3000|272=20130710|3  
 7016=20130710|37017=124518507|37=80142490132|288=3|290=1|279=0|269=4|22=8|2  
 07=BVMF|48=3809654|83=74046|270=6.74|273=124518508|271=3000|272=20130710|28  
 6=5|279=0|269=A|22=8|207=BVMF|48=3809654|83=74047|273=124518508|271=100|272  
 =20130710|277=Q|

1128=9|35=X|34=732079|52=20130710124518512|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3863917|83=3805|270=5.8|273=124518508|271=90|272=20130710|37  
 016=20130710|37017=124518508|37=80142490133|289=3|290=1|

1128=9|35=X|34=732080|52=20130710124518533|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809779|83=27895|270=7.13|273=124518529|271=2000|272=2013071  
 0|37016=20130710|37017=124518529|37=80142490134|289=3|290=1|

1128=9|35=X|34=732081|52=20130710124518539|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3901022|83=1511|270=16.25|273=124518535|271=15|272=20130710|  
 37016=20130710|37017=124518535|37=80142490135|288=3|290=1|

1128=9|35=X|34=732082|52=20130710124518542|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002184|83=5086|270=28.29|273=124518538|271=87|272=20130710|  
 37016=20130710|37017=124518538|37=80142490136|288=3|290=1|

1128=9|35=X|34=732083|52=20130710124518548|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11807|270=26.1|273=124518544|271=19|272=20130710|  
 37016=20130710|37017=124518544|37=80142490137|288=3|290=1|279=0|269=4|22=8|  
 207=BVMF|48=4002234|83=11808|270=26.01|273=124518544|271=20|272=20130710|28  
 6=5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11809|273=124518544|271=9|272=2  
 0130710|277=P|

1128=9|35=X|34=732084|52=20130710124518549|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803426|83=2938|270=11.13|273=124518545|271=400|272=20130710|  
 37016=20130710|37017=124518545|37=80142490138|288=3|290=1|

1128=9|35=X|34=732085|52=20130710124518551|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64754|270=4.23|273=124518547|271=900|272=20130710|  
 37016=20130710|37017=124518546|37=80142490139|288=3|290=93|

1128=9|35=X|34=732086|52=20130710124518552|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128724|270=12.9|273=124518548|271=300|272=2013071  
 0|37016=20130710|37017=124518547|37=80142490140|288=3|290=3|

1128=9|35=X|34=732087|52=20130710124518560|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128725|270=12.95|273=124518556|271=500|272=201307  
 10|37016=20130710|37017=124518555|37=80142490141|288=3|290=1|

1128=9|35=X|34=732088|52=20130710124518560|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128726|270=12.97|273=124518556|271=500|272=201307  
 10|37016=20130710|37017=124518555|37=80142490142|288=3|290=1|

1128=9|35=X|34=732089|52=20130710124518573|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128727|270=12.99|273=124518569|271=500|272=201307  
 10|37016=20130710|37017=124518569|37=80142490143|288=3|290=1|

1128=9|35=X|34=732090|52=20130710124518582|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128728|270=12.81|273=124518578|271=300|272=201307  
 10|37016=20130710|37017=124518578|37=80142490144|288=3|290=8|

1128=9|35=X|34=732091|52=20130710124518583|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53221|270=1.71|273=124518579|271=7000|272=2013071  
 0|37016=20130710|37017=124518579|37=80142490145|289=3|290=28|

1128=9|35=X|34=732092|52=20130710124518590|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371154|270=26.1|273=124518586|271=200|272=2013071  
 0|37016=20130710|37017=124518585|37=80142490146|288=3|290=4|

1128=9|35=X|34=732093|52=20130710124518592|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371155|270=26.05|273=124518587|271=100|272=201307  
 10|37016=20130710|37017=124518587|37=80142490147|288=3|290=5|

1128=9|35=X|34=732094|52=20130710124518600|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371156|270=26.67|273=124518595|271=300|272=201307  
 10|37016=20130710|37017=124518595|37=80142490148|289=3|290=7|

1128=9|35=X|34=732095|52=20130710124518601|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371157|270=27.08|273=124518597|271=300|272=201307  
 10|37016=20130710|37017=124518597|37=80142490149|289=3|290=29|

1128=9|35=X|34=732096|52=20130710124518626|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3897576|83=512|270=11.1|273=124518622|271=10|272=20130710|37  
 016=20130710|37017=124518622|37=80142490150|288=3|290=1|

1128=9|35=X|34=732097|52=20130710124518631|75=20130708|268=2|279=2|269=1|22  
 =8|207=BVMF|48=3805579|83=738|273=124518627|272=20130710|37=80142476912|289  
 =3|290=1|279=0|269=1|22=8|207=BVMF|48=3805579|83=739|270=1.79|273=124518627|  
 271=5000|272=20130710|37016=20130710|37017=124518627|37=80142490151|289=3|2  
 90=1|

1128=9|35=X|34=732098|52=20130710124518635|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805579|83=740|270=2.5|273=124518631|271=5000|272=20130710|3  
 7016=20130710|37017=124518631|37=80142490152|289=3|290=2|

1128=9|35=X|34=732099|52=20130710124518639|75=20130708|268=2|279=2|269=0|22  
 =8|207=BVMF|48=3803889|83=11202|273=124518634|272=20130710|37=80141953790|2  
 88=3|290=2|279=0|269=0|22=8|207=BVMF|48=3803889|83=11203|270=11.22|273=1245  
 18634|271=300|272=20130710|37016=20130710|37017=124518634|37=80142490153|28  
 8=3|290=3|

1128=9|35=X|34=732100|52=20130710124518643|75=20130710|268=1|279=0|269=0|22

=8|207=BVMF|48=3803889|83=11204|270=11.55|273=124518639|271=100|272=20130710|37016=20130710|37017=124518639|37=80142490154|288=3|290=1|  
 1128=9|35=X|34=732101|52=20130710124518990|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74048|270=7.97|273=124518986|271=100|272=20130710|37016=20130710|37017=124518986|37=80142490155|289=27|290=116|  
 1128=9|35=X|34=732102|52=20130710124519159|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64755|270=5.45|273=124519155|271=100|272=20130710|37016=20130710|37017=124519154|37=80142490156|288=72|290=2|  
 1128=9|35=X|34=732103|52=20130710124519175|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74049|270=7.77|273=124519171|271=100|272=20130710|37016=20130710|37017=124519170|37=80142490157|289=27|290=98|  
 1128=9|35=X|34=732104|52=20130710124521537|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74050|270=6.12|273=124521533|271=100|272=20130710|37016=20130710|37017=124521533|37=80142490174|288=27|290=42|  
 1128=9|35=X|34=732105|52=20130710124521790|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64756|270=5.12|273=124521786|271=100|272=20130710|37016=20130710|37017=124521786|37=80142490175|288=27|290=32|  
 1128=9|35=X|34=732106|52=20130710124522829|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53222|270=1.22|273=124522825|271=400|272=20130710|37016=20130710|37017=124522824|37=80142490177|288=27|290=31|  
 1128=9|35=X|34=732107|52=20130710124524420|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3806536|83=14284|270=3.9|273=124524415|271=100|272=20130710|37016=20130710|37017=124524415|37=80142490179|288=72|290=5|  
 1128=9|35=X|34=732108|52=20130710124525958|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64757|270=4.45|273=124525953|271=700|272=20130710|37016=20130710|37017=124525953|37=80142490180|288=27|290=89|  
 1128=9|35=X|34=732109|52=20130710124526760|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128729|270=12.9|273=124526756|271=500|272=20130710|37016=20130710|37017=124526756|37=80142490182|288=308|290=7|  
 1128=9|35=X|34=732110|52=20130710124528161|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371158|270=25.53|273=124528156|271=100|272=20130710|37016=20130710|37017=124528156|37=80142490185|288=27|290=41|  
 1128=9|35=X|34=732111|52=20130710124528271|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11810|270=25.53|273=124528267|271=50|272=20130710|37016=20130710|37017=124528267|37=80142490186|288=27|290=13|  
 1128=9|35=X|34=732112|52=20130710124529344|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3863917|83=3806|270=5.1|273=124529340|271=20|272=20130710|37016=20130710|37017=124529339|37=80142490188|288=27|290=8|

1128=9|35=X|34=732113|52=20130710124530048|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3897741|83=4785|270=11.9|273=124530043|271=10|272=20130710|3  
 7016=20130710|37017=124530043|37=80142490189|288=27|290=16|

1128=9|35=X|34=732114|52=20130710124530297|75=20130708|268=2|279=2|269=0|22  
 =8|207=BVMF|48=3803913|83=128730|273=124530293|272=20130710|37=80142143868|  
 288=70|290=12|279=0|269=0|22=8|207=BVMF|48=3803913|83=128731|270=12.38|273=  
 124530293|271=3000|272=20130710|37016=20130710|37017=124530293|37=801424901  
 90|288=70|290=36|

1128=9|35=X|34=732115|52=20130710124530297|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74051|270=6.3|273=124530293|271=500|272=20130710|  
 37016=20130710|37017=124530293|37=80142490191|288=70|290=32|

1128=9|35=X|34=732116|52=20130710124530319|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3863917|83=3807|270=5.4|273=124530315|271=44|272=20130710|37  
 016=20130710|37017=124530314|37=80142490192|288=70|290=1|

1128=9|35=X|34=732117|52=20130710124530485|75=20130708|268=2|279=2|269=0|22  
 =8|207=BVMF|48=3809654|83=74052|273=124530481|272=20130710|37=80141939508|2  
 88=70|290=10|279=0|269=0|22=8|207=BVMF|48=3809654|83=74053|270=6.51|273=124  
 530481|271=1500|272=20130710|37016=20130710|37017=124530481|37=80142490196|  
 288=70|290=6|

1128=9|35=X|34=732118|52=20130710124530514|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3897741|83=4786|270=12.9|273=124530510|271=52|272=20130710|3  
 7016=20130710|37017=124530510|37=80142490197|289=70|290=1|279=0|269=4|22=8|  
 207=BVMF|48=3897741|83=4787|270=12.9|273=124530510|271=52|272=20130710|286=  
 5|279=0|269=A|22=8|207=BVMF|48=3897741|83=4788|273=124530510|271=33|272=201  
 30710|277=PI

1128=9|35=X|34=732119|52=20130710124530621|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371159|270=25.9|273=124530617|271=100|272=2013071  
 0|37016=20130710|37017=124530616|37=80142490200|288=70|290=24|

1128=9|35=X|34=732120|52=20130710124530660|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53223|270=1.4|273=124530656|271=10000|272=2013071  
 0|37016=20130710|37017=124530656|37=80142490201|288=70|290=12|

1128=9|35=X|34=732121|52=20130710124530690|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64758|270=7.37|273=124530686|271=10000|272=201307  
 10|37016=20130710|37017=124530686|37=80142490202|289=70|290=93|

1128=9|35=X|34=732122|52=20130710124530711|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371160|270=25.56|273=124530707|271=8500|272=20130  
 710|37016=20130710|37017=124530707|37=80142490203|288=70|290=41|

1128=9|35=X|34=732123|52=20130710124530712|75=20130710|268=1|279=0|269=0|22

=8|207=BVMF|48=4002234|83=11811|270=25.56|273=124530707|271=15|272=20130710|  
37016=20130710|37017=124530707|37=80142490204|288=70|290=13|

1128=9|35=X|34=732124|52=20130710124531036|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11812|270=24.9|273=124531032|271=10|272=20130710|  
37016=20130710|37017=124531032|37=80142490205|288=27|290=42|

1128=9|35=X|34=732125|52=20130710124532394|75=20130710|268=2|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11813|270=26.2|273=124532390|271=10|272=20130710|  
37016=20130710|37017=124532390|37=80142490207|288=27|290=1|279=0|269=4|22=8|  
207=BVMF|48=4002234|83=11814|270=26.1|273=124532390|271=20|272=20130710|286  
=5|

1128=9|35=X|34=732126|52=20130710124533193|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64759|270=5.2|273=124533189|271=100|272=20130710|  
37016=20130710|37017=124533189|37=80142490208|288=27|290=28|

1128=9|35=X|34=732127|52=20130710124533574|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74054|270=5.5|273=124533569|271=100|272=20130710|  
37016=20130710|37017=124533569|37=80142490209|288=27|290=122|

1128=9|35=X|34=732128|52=20130710124534231|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3806536|83=14285|270=4.5|273=124534227|271=100|272=20130710|  
37016=20130710|37017=124534227|37=80142490210|289=27|290=1|

1128=9|35=X|34=732129|52=20130710124534339|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371161|270=25.92|273=124534335|271=200|272=201307  
10|37016=20130710|37017=124534334|37=80142490211|288=72|290=22|

1128=9|35=X|34=732130|52=20130710124534414|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11815|270=28|273=124534409|271=50|272=20130710|37  
016=20130710|37017=124534409|37=80142490212|288=72|290=1|279=0|269=4|22=8|2  
07=BVMF|48=4002234|83=11816|270=26.61|273=124534409|271=50|272=20130710|286  
=5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11817|273=124534409|271=69|272=2  
0130710|277=Q|

1128=9|35=X|34=732131|52=20130710124535016|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803426|83=2939|270=11.05|273=124535011|271=400|272=20130710|  
37016=20130710|37017=124535011|37=80142490213|288=72|290=3|

1128=9|35=X|34=732132|52=20130710124535373|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809639|83=371162|270=27.24|273=124535369|271=200|272=201307  
10|37016=20130710|37017=124535368|37=80142490214|289=27|290=38|

1128=9|35=X|34=732133|52=20130710124535637|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803913|83=128732|270=12.91|273=124535633|271=200|272=201307  
10|37016=20130710|37017=124535633|37=80142490215|288=72|290=6|

1128=9|35=X|34=732134|52=20130710124535700|75=20130710|268=1|279=0|269=0|22

=8|207=BVMF|48=3805660|83=53224|270=1.41|273=124535696|271=500|272=20130710|  
37016=20130710|37017=124535696|37=80142490216|288=72|290=11|

1128=9|35=X|34=732135|52=20130710124536337|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809779|83=27896|270=7.4|273=124536333|271=100|272=20130710|  
37016=20130710|37017=124536333|37=80142490219|289=72|290=4|

1128=9|35=X|34=732136|52=20130710124536365|75=20130710|268=1|279=0|269=0|22  
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37016=20130710|37017=124536361|37=80142490220|288=72|290=4|

1128=9|35=X|34=732137|52=20130710124536443|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371163|270=26.11|273=124536439|271=500|272=201307  
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1128=9|35=X|34=732138|52=20130710124537150|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=4002184|83=5087|270=29.53|273=124537146|271=9|272=20130710|3  
7016=20130710|37017=124537146|37=80142490222|289=72|290=1|

1128=9|35=X|34=732139|52=20130710124537391|75=20130703|268=2|279=2|269=0|22  
=8|207=BVMF|48=3802493|83=64760|273=124537387|272=20130710|37=80136963043|2  
88=27|290=21|279=0|269=0|22=8|207=BVMF|48=3802493|83=64761|270=5.21|273=124  
537387|271=600|272=20130710|37016=20130710|37017=124537386|37=80142490223|2  
88=27|290=23|

1128=9|35=X|34=732140|52=20130710124537862|75=20130710|268=1|279=0|269=0|22  
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016=20130710|37017=124537857|37=80142490224|288=72|290=1|

1128=9|35=X|34=732141|52=20130710124537891|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74055|270=6.5|273=124537886|271=400|272=20130710|  
37016=20130710|37017=124537886|37=80142490225|288=72|290=15|

1128=9|35=X|34=732142|52=20130710124538028|75=20130708|268=2|279=2|269=1|22  
=8|207=BVMF|48=3809654|83=74056|273=124538024|272=20130710|37=80142466285|2  
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538024|271=1600|272=20130710|37016=20130710|37017=124538024|37=80142490226|  
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1128=9|35=X|34=732143|52=20130710124539150|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809779|83=27898|270=6.87|273=124539145|271=1000|272=2013071  
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1128=9|35=X|34=732144|52=20130710124539322|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803913|83=128733|270=11|273=124539317|271=100|272=20130710|  
37016=20130710|37017=124539317|37=80142490229|288=72|290=99|

1128=9|35=X|34=732145|52=20130710124539822|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64762|270=4.5|273=124539817|271=300|272=20130710|

37016=20130710|37017=124539817|37=80142490231|288=72|290=89|

1128=9|35=X|34=732146|52=20130710124539893|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809779|83=27899|270=7.5|273=124539889|271=200|272=20130710|  
37016=20130710|37017=124539889|37=80142490233|289=72|290=6|

1128=9|35=X|34=732147|52=20130710124539933|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805660|83=53225|270=1.52|273=124539929|271=2000|272=2013071  
0|37016=20130710|37017=124539929|37=80142490234|288=386|290=3|

1128=9|35=X|34=732148|52=20130710124539951|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11818|270=25.4|273=124539947|271=50|272=20130710|  
37016=20130710|37017=124539947|37=80142490235|288=72|290=27|

1128=9|35=X|34=732149|52=20130710124540742|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805660|83=53226|270=1.41|273=124540738|271=14100|272=201307  
10|37016=20130710|37017=124540738|37=80142490236|288=72|290=13|

1128=9|35=X|34=732150|52=20130710124541262|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809779|83=27900|270=7.5|273=124541258|271=100|272=20130710|  
37016=20130710|37017=124541258|37=80142490238|289=131|290=7|

1128=9|35=X|34=732151|52=20130710124541363|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=4002184|83=5088|270=30.65|273=124541359|271=85|272=20130710|  
37016=20130710|37017=124541359|37=80142490239|289=72|290=6|

1128=9|35=X|34=732152|52=20130710124542025|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371164|270=26.4|273=124542020|271=200|272=2013071  
0|37016=20130710|37017=124542019|37=80142490240|288=72|290=3|279=0|269=4|22  
=8|207=BVMF|48=3809639|83=371165|270=26.39|273=124542020|271=1900|272=20130  
710|286=5|279=0|269=A|22=8|207=BVMF|48=3809639|83=371166|273=124542020|271=  
41300|272=20130710|277=Q|

1128=9|35=X|34=732153|52=20130710124542132|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3803913|83=128734|270=13.63|273=124542128|271=200|272=201307  
10|37016=20130710|37017=124542128|37=80142490241|289=72|290=10|

1128=9|35=X|34=732154|52=20130710124543576|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803913|83=128735|270=12.85|273=124543572|271=300|272=201307  
10|37016=20130710|37017=124543571|37=80142490243|288=72|290=10|

1128=9|35=X|34=732155|52=20130710124543576|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3897741|83=4789|270=12.85|273=124543572|271=89|272=20130710|  
37016=20130710|37017=124543572|37=80142490244|288=72|290=3|

1128=9|35=X|34=732156|52=20130710124543588|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3803889|83=11205|270=12.5|273=124543584|271=100|272=20130710|  
37016=20130710|37017=124543584|37=80142490245|289=72|290=4|

1128=9|35=X|34=732157|52=20130710124543605|75=20130710|268=1|279=0|269=1|22

=8|207=BVMF|48=3897576|83=513|270=12.5|273=124543600|271=50|272=20130710|37  
016=20130710|37017=124543600|37=80142490246|289=72|290=2|

1128=9|35=X|34=732158|52=20130710124543708|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64763|270=11.13|273=124543704|271=200|272=2013071  
0|37016=20130710|37017=124543704|37=80142490247|289=72|290=193|

1128=9|35=X|34=732159|52=20130710124543723|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3804069|83=13707|270=12.91|273=124543719|271=500|272=2013071  
0|37016=20130710|37017=124543719|37=80142490248|288=72|290=1|

1128=9|35=X|34=732160|52=20130710124544199|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809779|83=27901|270=6.51|273=124544195|271=900|272=20130710|  
37016=20130710|37017=124544195|37=80142490249|288=72|290=6|

1128=9|35=X|34=732161|52=20130710124544200|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74058|270=5.81|273=124544195|271=900|272=20130710|  
37016=20130710|37017=124544195|37=80142490250|288=72|290=72|

1128=9|35=X|34=732162|52=20130710124544200|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803889|83=11206|270=11.05|273=124544196|271=900|272=2013071  
0|37016=20130710|37017=124544196|37=80142490251|288=72|290=6|

1128=9|35=X|34=732163|52=20130710124544297|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74059|270=6.2|273=124544293|271=200|272=20130710|  
37016=20130710|37017=124544292|37=80142490252|288=72|290=40|

1128=9|35=X|34=732164|52=20130710124544344|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64764|270=5|273=124544340|271=200|272=20130710|37  
016=20130710|37017=124544340|37=80142490253|288=72|290=68|

1128=9|35=X|34=732165|52=20130710124544390|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64765|270=12.07|273=124544385|271=100|272=2013071  
0|37016=20130710|37017=124544385|37=80142490254|289=72|290=205|

1128=9|35=X|34=732166|52=20130710124544840|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64766|270=12.29|273=124544836|271=300|272=2013071  
0|37016=20130710|37017=124544836|37=80142490255|289=72|290=207|

1128=9|35=X|34=732167|52=20130710124544983|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3803913|83=128736|270=13.3|273=124544979|271=2500|272=201307  
10|37016=20130710|37017=124544979|37=80142490256|289=72|290=41|

1128=9|35=X|34=732168|52=20130710124544999|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3897741|83=4790|270=13.3|273=124544994|271=62|272=20130710|3  
7016=20130710|37017=124544994|37=80142490257|289=72|290=2|

1128=9|35=X|34=732169|52=20130710124545710|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74060|270=6.51|273=124545705|271=1000|272=2013071  
0|37016=20130710|37017=124545705|37=80142490258|288=72|290=7|

1128=9|35=X|34=732170|52=20130710124545826|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3897741|83=4791|270=13.2|273=124545822|271=8|272=20130710|37  
 016=20130710|37017=124545822|37=80142490259|289=72|290=2|

1128=9|35=X|34=732171|52=20130710124547699|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64767|270=5.4|273=124547695|271=900|272=20130710|  
 37016=20130710|37017=124547695|37=80142490261|288=72|290=10|

1128=9|35=X|34=732172|52=20130710124547700|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3863917|83=3808|270=5.4|273=124547695|271=25|272=20130710|37  
 016=20130710|37017=124547695|37=80142490262|288=72|290=2|

1128=9|35=X|34=732173|52=20130710124547741|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803947|83=72196|270=16.1|273=124547737|271=100|272=20130710|  
 37016=20130710|37017=124547737|37=80142490263|288=72|290=1|

1128=9|35=X|34=732174|52=20130710124547949|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11819|270=26.29|273=124547945|271=7|272=20130710|  
 37016=20130710|37017=124547945|37=80142490264|289=72|290=2|279=0|269=A|22=8|  
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1128=9|35=X|34=732175|52=20130710124548977|75=20130708|268=1|279=2|269=1|22  
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1128=9|35=X|34=732176|52=20130710124549464|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803426|83=2940|270=11.5|273=124549460|271=100|272=20130710|  
 37016=20130710|37017=124549460|37=80142490267|289=72|290=1|

1128=9|35=X|34=732177|52=20130710124549520|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002184|83=5089|270=28.38|273=124549516|271=35|272=20130710|  
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1128=9|35=X|34=732178|52=20130710124549639|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3901022|83=1512|270=17|273=124549635|271=14|272=20130710|370  
 16=20130710|37017=124549635|37=80142490269|289=72|290=1|

1128=9|35=X|34=732179|52=20130710124550309|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74061|270=6.53|273=124550305|271=100|272=20130710|  
 37016=20130710|37017=124550304|37=80142490270|288=72|290=4|

1128=9|35=X|34=732180|52=20130710124550337|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3863917|83=3809|270=6|273=124550333|271=28|272=20130710|3701  
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1128=9|35=X|34=732181|52=20130710124550454|75=20130625|268=1|279=2|269=1|22  
 =8|207=BVMF|48=3809639|83=371167|273=124550450|272=20130710|37=80124741935|  
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1128=9|35=X|34=732182|52=20130710124550987|75=20130710|268=1|279=0|269=1|22

=8|207=BVMF|48=3997293|83=2832|270=7.98|273=124550982|271=40|272=20130710|3  
7016=20130710|37017=124550982|37=80142490272|289=72|290=9|

1128=9|35=X|34=732183|52=20130710124550987|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=4002234|83=11821|270=28.5|273=124550983|271=4|272=20130710|3  
7016=20130710|37017=124550983|37=80142490273|289=72|290=23|

1128=9|35=X|34=732184|52=20130710124551178|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74062|270=6.59|273=124551174|271=100|272=20130710|  
37016=20130710|37017=124551174|37=80142490274|288=72|290=2|

1128=9|35=X|34=732185|52=20130710124551192|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3997293|83=2833|270=6.59|273=124551188|271=51|272=20130710|3  
7016=20130710|37017=124551188|37=80142490275|288=72|290=1|

1128=9|35=X|34=732186|52=20130710124551207|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809779|83=27902|270=6.86|273=124551203|271=100|272=20130710|  
37016=20130710|37017=124551203|37=80142490276|288=72|290=2|

1128=9|35=X|34=732187|52=20130710124551634|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3996923|83=692|270=6.86|273=124551630|271=45|272=20130710|37  
016=20130710|37017=124551630|37=80142490277|288=72|290=2|

1128=9|35=X|34=732188|52=20130710124551804|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11822|270=29.9|273=124551800|271=20|272=20130710|  
37016=20130710|37017=124551799|37=80142490278|289=72|290=35|

1128=9|35=X|34=732189|52=20130710124551818|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3863917|83=3810|270=5.46|273=124551813|271=91|272=20130710|3  
7016=20130710|37017=124551813|37=80142490279|288=72|290=1|

1128=9|35=X|34=732190|52=20130710124552403|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371168|270=26|273=124552398|271=500|272=20130710|  
37016=20130710|37017=124552398|37=80142490280|288=72|290=21|

1128=9|35=X|34=732191|52=20130710124552496|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74063|270=6.45|273=124552491|271=500|272=20130710|  
37016=20130710|37017=124552491|37=80142490281|288=72|290=26|

1128=9|35=X|34=732192|52=20130710124552512|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3805660|83=53227|270=1.7|273=124552508|271=1000|272=20130710|  
37016=20130710|37017=124552507|37=80142490282|288=72|290=1|279=0|269=4|22=8|  
207=BVMF|48=3805660|83=53228|270=1.54|273=124552508|271=1700|272=20130710|2  
86=5|279=0|269=A|22=8|207=BVMF|48=3805660|83=53229|273=124552508|271=18300|  
272=20130710|277=Q|

1128=9|35=X|34=732193|52=20130710124552555|75=20130710|268=3|279=0|269=1|22  
=8|207=BVMF|48=4002234|83=11823|270=26.6|273=124552551|271=85|272=20130710|  
37016=20130710|37017=124552551|37=80142490283|289=72|290=3|279=0|269=4|22=8|

207=BVMF|48=4002234|83=11824|270=26.6|273=124552551|271=50|272=20130710|286  
=5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11825|273=124552551|271=62|272=2  
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1128=9|35=X|34=732194|52=20130710124553073|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3863917|83=3811|270=5.11|273=124553069|271=50|272=20130710|3  
7016=20130710|37017=124553069|37=80142490285|288=72|290=11|

1128=9|35=X|34=732195|52=20130710124553166|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371169|270=26.01|273=124553161|271=400|272=201307  
10|37016=20130710|37017=124553161|37=80142490286|288=72|290=9|

1128=9|35=X|34=732196|52=20130710124553179|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805660|83=53230|270=1.52|273=124553174|271=6600|272=2013071  
0|37016=20130710|37017=124553174|37=80142490287|288=72|290=5|

1128=9|35=X|34=732197|52=20130710124553216|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74064|270=6.59|273=124553212|271=1500|272=2013071  
0|37016=20130710|37017=124553212|37=80142490288|288=72|290=3|

1128=9|35=X|34=732198|52=20130710124553252|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371170|270=26.05|273=124553247|271=100|272=201307  
10|37016=20130710|37017=124553247|37=80142490289|288=72|290=8|

1128=9|35=X|34=732199|52=20130710124554372|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53231|270=1.6|273=124554367|271=1100|272=20130710|  
37016=20130710|37017=124554367|37=80142490290|289=72|290=7|

1128=9|35=X|34=732200|52=20130710124554398|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3803913|83=128737|270=13.32|273=124554394|271=100|272=201307  
10|37016=20130710|37017=124554394|37=80142490291|288=72|290=1|279=0|269=4|2  
2=8|207=BVMF|48=3803913|83=128738|270=13.15|273=124554394|271=100|272=20130  
710|286=5|279=0|269=A|22=8|207=BVMF|48=3803913|83=128739|273=124554394|271=  
3900|272=20130710|277=Q|

1128=9|35=X|34=732201|52=20130710124554473|75=20130710|268=2|279=0|269=1|22  
=8|207=BVMF|48=4002234|83=11826|270=26.15|273=124554469|271=10|272=20130710|  
37016=20130710|37017=124554469|37=80142490292|289=72|290=2|279=0|269=A|22=8|  
207=BVMF|48=4002234|83=11827|273=124554469|271=72|272=20130710|277=Q|

1128=9|35=X|34=732202|52=20130710124555856|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371171|270=26.03|273=124555852|271=500|272=201307  
10|37016=20130710|37017=124555851|37=80142490293|288=72|290=9|

1128=9|35=X|34=732203|52=20130710124556610|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805587|83=445|270=0.21|273=124556605|271=7000|272=20130710|  
37016=20130710|37017=124556605|37=80142490294|288=72|290=8|

1128=9|35=X|34=732204|52=20130710124556623|75=20130710|268=1|279=0|269=0|22

=8|207=BVMF|48=3805587|83=446|270=0.31|273=124556619|271=4000|272=20130710|  
37016=20130710|37017=124556619|37=80142490295|288=72|290=3|

1128=9|35=X|34=732205|52=20130710124556665|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805587|83=447|270=0.33|273=124556661|271=4000|272=20130710|  
37016=20130710|37017=124556661|37=80142490296|288=72|290=3|

1128=9|35=X|34=732206|52=20130710124557123|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64768|270=10|273=124557119|271=600|272=20130710|3  
7016=20130710|37017=124557119|37=80142490297|289=72|290=179|

1128=9|35=X|34=732207|52=20130710124557231|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809779|83=27903|270=8.5|273=124557227|271=400|272=20130710|  
37016=20130710|37017=124557227|37=80142490298|289=72|290=181|

1128=9|35=X|34=732208|52=20130710124557819|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3863917|83=3812|270=5.42|273=124557815|271=50|272=20130710|3  
7016=20130710|37017=124557815|37=80142490300|288=72|290=2|

1128=9|35=X|34=732209|52=20130710124557820|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64769|270=5.64|273=124557816|271=100|272=20130710|  
37016=20130710|37017=124557815|37=80142490301|289=72|290=4|

1128=9|35=X|34=732210|52=20130710124557820|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3863917|83=3813|270=5.64|273=124557816|271=50|272=20130710|3  
7016=20130710|37017=124557816|37=80142490302|289=72|290=1|

1128=9|35=X|34=732211|52=20130710124558495|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3997293|83=2834|270=6.54|273=124558490|271=40|272=20130710|3  
7016=20130710|37017=124558490|37=80142490304|288=72|290=2|

1128=9|35=X|34=732212|52=20130710124558507|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3997293|83=2835|270=6.67|273=124558503|271=50|272=20130710|3  
7016=20130710|37017=124558503|37=80142490305|289=72|290=1|

1128=9|35=X|34=732213|52=20130710124558639|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=4002184|83=5090|270=28.39|273=124558635|271=28|272=20130710|  
37016=20130710|37017=124558635|37=80142490306|288=72|290=1|

1128=9|35=X|34=732214|52=20130710124559358|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371172|270=25.46|273=124559354|271=5000|272=20130  
710|37016=20130710|37017=124559353|37=80142490307|288=72|290=70|

1128=9|35=X|34=732215|52=20130710124559363|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371173|273=124559359|271=14700|272=20130710|37016  
=20130710|37017=124559356|37=80142490308|288=8|290=1|279=0|269=4|22=8|207=B  
VMF|48=3809639|83=371174|270=26.39|273=124559359|271=16600|272=20130710|286  
=5|279=0|269=A|22=8|207=BVMF|48=3809639|83=371175|273=124559359|271=26600|2  
72=20130710|277=Q|

1128=9|35=X|34=732216|52=20130710124559412|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128740|270=12.21|273=124559407|271=5000|272=20130  
 710|37016=20130710|37017=124559407|37=80142490309|288=72|290=45|

1128=9|35=X|34=732217|52=20130710124600037|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371176|270=26.08|273=124600032|271=200|272=20130  
 10|37016=20130710|37017=124600029|37=80142490311|289=58|290=2|279=0|269=A|2  
 2=8|207=BVMF|48=3809639|83=371177|273=124600032|271=26800|272=20130710|277=  
 Q|

1128=9|35=X|34=732218|52=20130710124600108|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64770|270=5.75|273=124600103|271=200|272=20130710  
 37016=20130710|37017=124600103|37=80142490312|289=72|290=8|

1128=9|35=X|34=732219|52=20130710124600115|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371178|270=26.2|273=124600110|271=100|272=2013071  
 0|37016=20130710|37017=124600108|37=80142490313|289=58|290=3|279=0|269=A|22  
 =8|207=BVMF|48=3809639|83=371179|273=124600110|271=26900|272=20130710|277=Q|

1128=9|35=X|34=732220|52=20130710124600139|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128741|270=12.95|273=124600134|271=500|272=201307  
 10|37016=20130710|37017=124600134|37=80142490314|289=58|290=1|279=0|269=4|2  
 2=8|207=BVMF|48=3803913|83=128742|270=12.99|273=124600134|271=500|272=20130  
 710|286=5|279=0|269=A|22=8|207=BVMF|48=3803913|83=128743|273=124600134|271=  
 100|272=20130710|277=P|

1128=9|35=X|34=732221|52=20130710124600195|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74065|270=7.75|273=124600190|271=100|272=20130710  
 37016=20130710|37017=124600190|37=80142490315|289=72|290=98|

1128=9|35=X|34=732222|52=20130710124600399|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371180|270=27.1|273=124600395|271=100|272=2013071  
 0|37016=20130710|37017=124600392|37=80142490316|289=58|290=34|

1128=9|35=X|34=732223|52=20130710124600481|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11828|270=24.91|273=124600477|271=50|272=20130710  
 37016=20130710|37017=124600476|37=80142490317|289=58|290=1|279=0|269=4|22=8|  
 207=BVMF|48=4002234|83=11829|270=26.1|273=124600477|271=70|272=20130710|286  
 =5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11830|273=124600477|271=9|272=20  
 130710|277=P|

1128=9|35=X|34=732224|52=20130710124600634|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3997293|83=2836|270=7.75|273=124600630|271=50|272=20130710|3  
 7016=20130710|37017=124600630|37=80142490319|289=72|290=9|

1128=9|35=X|34=732225|52=20130710124600652|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3897741|83=4792|270=13.2|273=124600648|271=50|272=20130710|3  
 7016=20130710|37017=124600648|37=80142490320|289=72|290=3|

1128=9|35=X|34=732226|52=20130710124600706|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803947|83=72197|270=15.8|273=124600701|271=100|272=20130710|  
 37016=20130710|37017=124600701|37=80142490321|288=72|290=4|

1128=9|35=X|34=732227|52=20130710124600801|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64771|270=5.4|273=124600797|271=1000|272=20130710|  
 37016=20130710|37017=124600796|37=80142490322|288=72|290=11|

1128=9|35=X|34=732228|52=20130710124600833|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371181|270=26|273=124600829|271=500|272=20130710|  
 37016=20130710|37017=124600826|37=80142490323|288=72|290=26|

1128=9|35=X|34=732229|52=20130710124600833|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74066|270=6.5|273=124600829|271=1300|272=20130710|  
 37016=20130710|37017=124600828|37=80142490324|288=72|290=20|

1128=9|35=X|34=732230|52=20130710124600945|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64772|270=5.4|273=124600941|271=8000|272=20130710|  
 37016=20130710|37017=124600941|37=80142490325|288=102|290=12|

1128=9|35=X|34=732231|52=20130710124601028|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371182|270=27|273=124601023|271=400|272=20130710|  
 37016=20130710|37017=124601021|37=80142490326|289=102|290=29|

1128=9|35=X|34=732232|52=20130710124601066|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53232|270=1.55|273=124601061|271=2700|272=2013071  
 0|37016=20130710|37017=124601061|37=80142490327|289=102|290=2|

1128=9|35=X|34=732233|52=20130710124601150|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53233|270=1.5|273=124601146|271=200|272=20130710|  
 37016=20130710|37017=124601145|37=80142490328|289=102|290=1|279=0|269=A|22=  
 8|207=BVMF|48=3805660|83=53234|273=124601146|271=18500|272=20130710|277=Q|

1128=9|35=X|34=732234|52=20130710124601326|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11831|270=26|273=124601321|271=12|272=20130710|37  
 016=20130710|37017=124601321|37=80142490329|288=72|290=9|

1128=9|35=X|34=732235|52=20130710124601487|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74067|270=6.6|273=124601482|271=1300|272=20130710|  
 37016=20130710|37017=124601482|37=80142490330|288=72|290=2|

1128=9|35=X|34=732236|52=20130710124601679|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74068|270=5.62|273=124601675|271=400|272=20130710|  
 37016=20130710|37017=124601675|37=80142490331|288=114|290=120|

1128=9|35=X|34=732237|52=20130710124602381|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53235|270=1.7|273=124602377|271=4400|272=20130710|  
 37016=20130710|37017=124602376|37=80142490333|289=114|290=31|

1128=9|35=X|34=732238|52=20130710124602451|75=20130710|268=1|279=0|269=1|22

=8|207=BVMF|48=3803947|83=72198|270=16.75|273=124602447|271=100|272=2013071  
0|37016=20130710|37017=124602446|37=80142490334|289=72|290=3|

1128=9|35=X|34=732239|52=20130710124603306|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3803947|83=72199|270=16.39|273=124603302|271=100|272=2013071  
0|37016=20130710|37017=124603301|37=80142490335|289=72|290=2|

1128=9|35=X|34=732240|52=20130710124603322|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3901022|83=1513|270=16.39|273=124603318|271=84|272=20130710|  
37016=20130710|37017=124603318|37=80142490336|289=72|290=1|

1128=9|35=X|34=732241|52=20130710124603323|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64773|270=5.68|273=124603319|271=10000|272=201307  
10|37016=20130710|37017=124603318|37=80142490337|289=72|290=6|

1128=9|35=X|34=732242|52=20130710124603324|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64774|270=5.5|273=124603319|271=500|272=20130710|  
37016=20130710|37017=124603319|37=80142490338|288=72|290=1|279=0|269=4|22=8|  
207=BVMF|48=3802493|83=64775|270=5.5|273=124603319|271=500|272=20130710|286  
=5|279=0|269=A|22=8|207=BVMF|48=3802493|83=64776|273=124603319|271=1500|272  
=20130710|277=Q|

1128=9|35=X|34=732243|52=20130710124603337|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803913|83=128744|270=12.95|273=124603333|271=200|272=201307  
10|37016=20130710|37017=124603333|37=80142490339|288=72|290=5|

1128=9|35=X|34=732244|52=20130710124603351|75=20130710|268=2|279=0|269=0|22  
=8|207=BVMF|48=3897741|83=4793|270=12.95|273=124603347|271=50|272=20130710|  
37016=20130710|37017=124603347|37=80142490340|288=72|290=1|279=0|269=A|22=8|  
207=BVMF|48=3897741|83=4794|273=124603347|271=83|272=20130710|277=P|

1128=9|35=X|34=732245|52=20130710124603370|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74069|270=5.8|273=124603366|271=600|272=20130710|  
37016=20130710|37017=124603365|37=80142490341|288=72|290=82|

1128=9|35=X|34=732246|52=20130710124603506|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74070|270=6.6|273=124603502|271=300|272=20130710|  
37016=20130710|37017=124603502|37=80142490342|288=72|290=3|

1128=9|35=X|34=732247|52=20130710124603540|75=20130710|268=3|279=0|269=1|22  
=8|207=BVMF|48=3996923|83=693|270=6.85|273=124603536|271=29|272=20130710|37  
016=20130710|37017=124603536|37=80142490343|289=72|290=1|279=0|269=4|22=8|2  
07=BVMF|48=3996923|83=694|270=6.86|273=124603536|271=29|272=20130710|286=5|  
279=0|269=A|22=8|207=BVMF|48=3996923|83=695|273=124603536|271=46|272=201307  
10|277=P|

1128=9|35=X|34=732248|52=20130710124603983|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53236|270=1.7|273=124603978|271=6100|272=20130710|

37016=20130710|37017=124603978|37=80142490344|289=72|290=32|

1128=9|35=X|34=732249|52=20130710124604231|75=20130708|268=1|279=2|269=1|22  
 =8|207=BVMF|48=3805660|83=53237|273=124604227|272=20130710|37=80140670240|2  
 89=72|290=25|

1128=9|35=X|34=732250|52=20130710124604238|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74071|270=8|273=124604234|271=100|272=20130710|37  
 016=20130710|37017=124604234|37=80142490345|289=102|290=128|

1128=9|35=X|34=732251|52=20130710124604427|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74072|270=6.5|273=124604423|271=200|272=20130710|  
 37016=20130710|37017=124604423|37=80142490346|288=102|290=23|

1128=9|35=X|34=732252|52=20130710124604553|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64777|270=5.69|273=124604549|271=3000|272=2013071  
 0|37016=20130710|37017=124604549|37=80142490347|289=102|290=7|

1128=9|35=X|34=732253|52=20130710124604594|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64778|270=5.29|273=124604590|271=3000|272=2013071  
 0|37016=20130710|37017=124604589|37=80142490348|288=102|290=19|

1128=9|35=X|34=732254|52=20130710124604993|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128745|270=12.95|273=124604989|271=100|272=201307  
 10|37016=20130710|37017=124604989|37=80142490349|288=102|290=6|

1128=9|35=X|34=732255|52=20130710124605197|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805587|83=448|270=0.3|273=124605193|271=50000|272=20130710|  
 37016=20130710|37017=124605193|37=80142490350|288=102|290=7|

1128=9|35=X|34=732256|52=20130710124605238|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371183|270=26|273=124605234|271=100|272=20130710|  
 37016=20130710|37017=124605231|37=80142490351|288=102|290=27|

1128=9|35=X|34=732257|52=20130710124605292|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74073|270=6.56|273=124605288|271=9000|272=2013071  
 0|37016=20130710|37017=124605288|37=80142490352|289=114|290=1|279=0|269=4|2  
 2=8|207=BVMF|48=3809654|83=74074|270=6.56|273=124605288|271=6700|272=201307  
 10|286=5|279=0|269=A|22=8|207=BVMF|48=3809654|83=74075|273=124605288|271=23  
 00|272=20130710|277=Q|

1128=9|35=X|34=732258|52=20130710124605414|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74076|270=6.75|273=124605409|271=100|272=20130710|  
 37016=20130710|37017=124605409|37=80142490353|289=72|290=8|

1128=9|35=X|34=732259|52=20130710124605464|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11832|270=25.9|273=124605459|271=15|272=20130710|  
 37016=20130710|37017=124605459|37=80142490354|288=72|290=11|

1128=9|35=X|34=732260|52=20130710124605464|75=20130710|268=1|279=0|269=1|22

=8|207=BVMF|48=4002234|83=11833|270=26.5|273=124605460|271=15|272=20130710|  
37016=20130710|37017=124605460|37=80142490355|289=72|290=5|

1128=9|35=X|34=732261|52=20130710124605708|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371184|270=26.01|273=124605704|271=1000|272=20130  
710|37016=20130710|37017=124605701|37=80142490356|288=114|290=13|

1128=9|35=X|34=732262|52=20130710124605746|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53238|270=1.7|273=124605741|271=1700|272=20130710|  
37016=20130710|37017=124605741|37=80142490357|289=21|290=32|

1128=9|35=X|34=732263|52=20130710124605995|75=20130710|268=3|279=0|269=1|22  
=8|207=BVMF|48=3897741|83=4795|270=12.9|273=124605990|271=10|272=20130710|3  
7016=20130710|37017=124605990|37=80142490358|289=72|290=2|279=0|269=4|22=8|  
207=BVMF|48=3897741|83=4796|270=12.9|273=124605990|271=62|272=20130710|286=  
5|279=0|269=A|22=8|207=BVMF|48=3897741|83=4797|273=124605990|271=73|272=201  
30710|277=PI

1128=9|35=X|34=732264|52=20130710124606010|75=20130710|268=3|279=0|269=1|22  
=8|207=BVMF|48=3901022|83=1514|270=16.1|273=124606006|271=10|272=20130710|3  
7016=20130710|37017=124606006|37=80142490359|289=72|290=1|279=0|269=4|22=8|  
207=BVMF|48=3901022|83=1515|270=16.25|273=124606006|271=10|272=20130710|286=  
5|279=0|269=A|22=8|207=BVMF|48=3901022|83=1516|273=124606006|271=5|272=201  
30710|277=PI

1128=9|35=X|34=732265|52=20130710124606069|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371185|270=25.52|273=124606064|271=100|272=20130  
710|37016=20130710|37017=124606062|37=80142490360|288=72|290=56|

1128=9|35=X|34=732266|52=20130710124606792|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64779|270=6.07|273=124606787|271=300|272=20130710|  
37016=20130710|37017=124606787|37=80142490362|289=72|290=31|

1128=9|35=X|34=732267|52=20130710124606806|75=20130705|268=1|279=2|269=0|22  
=8|207=BVMF|48=3802493|83=64780|273=124606801|272=20130710|37=80138290197|2  
88=72|290=50|

1128=9|35=X|34=732268|52=20130710124606882|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53239|270=1.6|273=124606877|271=2200|272=20130710|  
37016=20130710|37017=124606877|37=80142490363|289=72|290=10|

1128=9|35=X|34=732269|52=20130710124606882|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3940368|83=794|270=1.6|273=124606878|271=80|272=20130710|370  
16=20130710|37017=124606878|37=80142490364|289=72|290=11|

1128=9|35=X|34=732270|52=20130710124606898|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371186|270=26.1|273=124606893|271=200|272=2013071  
0|37016=20130710|37017=124606891|37=80142490365|288=72|290=8|

1128=9|35=X|34=732271|52=20130710124606910|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371187|273=124606905|271=14700|272=20130710|37016  
 =20130710|37017=124606905|37=80142490366|289=8|290=1|279=0|269=A|22=8|207=B  
 VMF|48=3809639|83=371188|273=124606905|271=41600|272=20130710|277=Q|

1128=9|35=X|34=732272|52=20130710124606967|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74077|270=6.55|273=124606963|271=500|272=20130710|  
 37016=20130710|37017=124606962|37=80142490367|288=72|290=8|

1128=9|35=X|34=732273|52=20130710124606968|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74078|270=6.38|273=124606964|271=5000|272=20130710|  
 37016=20130710|37017=124606964|37=80142490368|288=72|290=39|

1128=9|35=X|34=732274|52=20130710124607554|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371189|270=25.95|273=124607550|271=400|272=20130710|  
 37016=20130710|37017=124607549|37=80142490369|288=72|290=33|

1128=9|35=X|34=732275|52=20130710124607671|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371190|270=25|273=124607667|271=1000|272=20130710|  
 37016=20130710|37017=124607666|37=80142490370|288=72|290=160|

1128=9|35=X|34=732276|52=20130710124607671|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74079|270=6.55|273=124607667|271=1900|272=20130710|  
 37016=20130710|37017=124607667|37=80142490371|288=72|290=9|

1128=9|35=X|34=732277|52=20130710124607824|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53240|270=1.52|273=124607820|271=2000|272=20130710|  
 37016=20130710|37017=124607820|37=80142490372|288=129|290=6|

1128=9|35=X|34=732278|52=20130710124608798|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11834|270=26.6|273=124608794|271=30|272=20130710|  
 37016=20130710|37017=124608793|37=80142490373|289=102|290=7|

1128=9|35=X|34=732279|52=20130710124608826|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74080|270=6.59|273=124608822|271=100|272=20130710|  
 37016=20130710|37017=124608822|37=80142490374|288=21|290=6|279=0|269=4|22=8|  
 207=BVMF|48=3809654|83=74081|270=6.56|273=124608822|271=6800|272=20130710|2  
 86=5|279=0|269=A|22=8|207=BVMF|48=3809654|83=74082|273=124608822|271=2200|2  
 72=20130710|277=Q|

1128=9|35=X|34=732280|52=20130710124609474|75=20130710|268=2|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64781|270=5.46|273=124609469|271=300|272=20130710|  
 37016=20130710|37017=124609469|37=80142490376|289=114|290=1|279=0|269=A|22=8|  
 207=BVMF|48=3802493|83=64782|273=124609469|271=1800|272=20130710|277=Q|

1128=9|35=X|34=732281|52=20130710124610281|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11835|270=26.66|273=124610276|271=77|272=20130710|  
 37016=20130710|37017=124610276|37=80142490377|289=114|290=9|

1128=9|35=X|34=732282|52=20130710124610345|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53241|270=1.52|273=124610341|271=2000|272=2013071  
 0|37016=20130710|37017=124610341|37=80142490378|288=114|290=7|

1128=9|35=X|34=732283|52=20130710124610399|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64783|270=6.45|273=124610395|271=400|272=20130710|  
 37016=20130710|37017=124610395|37=80142490379|289=72|290=50|

1128=9|35=X|34=732284|52=20130710124610443|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128746|270=13.29|273=124610439|271=400|272=201307  
 10|37016=20130710|37017=124610439|37=80142490380|289=72|290=4|

1128=9|35=X|34=732285|52=20130710124610502|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53242|270=1.75|273=124610498|271=1700|272=2013071  
 0|37016=20130710|37017=124610498|37=80142490381|289=72|290=50|

1128=9|35=X|34=732286|52=20130710124610516|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64784|270=5.45|273=124610512|271=500|272=20130710|  
 37016=20130710|37017=124610511|37=80142490382|288=72|290=4|

1128=9|35=X|34=732287|52=20130710124610861|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53243|270=1.48|273=124610857|271=2000|272=2013071  
 0|37016=20130710|37017=124610857|37=80142490383|288=114|290=11|

1128=9|35=X|34=732288|52=20130710124611038|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74083|270=7.99|273=124611034|271=400|272=20130710|  
 37016=20130710|37017=124611034|37=80142490384|289=72|290=122|

1128=9|35=X|34=732289|52=20130710124611151|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809779|83=27904|270=6.98|273=124611147|271=1500|272=2013071  
 0|37016=20130710|37017=124611147|37=80142490385|288=72|290=1|

1128=9|35=X|34=732290|52=20130710124611347|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371191|270=26.11|273=124611343|271=200|272=201307  
 10|37016=20130710|37017=124611342|37=80142490386|288=114|290=7|

1128=9|35=X|34=732291|52=20130710124611620|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805579|83=741|270=1|273=124611615|271=200|272=20130710|3701  
 6=20130710|37017=124611615|37=80142490387|288=72|290=5|

1128=9|35=X|34=732292|52=20130710124611853|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809688|83=237541|270=28.38|273=124611849|271=100|272=201307  
 10|37016=20130710|37017=124611849|37=80142490388|288=114|290=2|

1128=9|35=X|34=732293|52=20130710124612056|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64785|270=5.4|273=124612052|271=4700|272=20130710|  
 37016=20130710|37017=124612051|37=80142490389|288=39|290=15|

1128=9|35=X|34=732294|52=20130710124612152|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64786|270=5.43|273=124612148|271=400|272=20130710|

37016=20130710|37017=124612148|37=80142490390|288=102|290=7|

1128=9|35=X|34=732295|52=20130710124612252|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11836|270=26.01|273=124612248|271=8|272=20130710|  
 37016=20130710|37017=124612247|37=80142490391|288=102|290=5|

1128=9|35=X|34=732296|52=20130710124612501|75=20130708|268=1|279=2|269=0|22  
 =8|207=BVMF|48=3805660|83=53244|273=124612496|272=20130710|37=80142480622|2  
 88=72|290=8|

1128=9|35=X|34=732297|52=20130710124612544|75=20130710|268=2|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11837|270=26.1|273=124612540|271=17|272=20130710|  
 37016=20130710|37017=124612540|37=80142490392|288=102|290=4|279=0|269=A|22=8|  
 |207=BVMF|48=4002234|83=11838|273=124612540|271=26|272=20130710|277=P|

1128=9|35=X|34=732298|52=20130710124612585|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128747|270=24.31|273=124612580|271=500|272=20130710|  
 37016=20130710|37017=124612580|37=80142490393|289=114|290=271|

1128=9|35=X|34=732299|52=20130710124612622|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64787|270=5.4|273=124612618|271=10000|272=20130710|  
 37016=20130710|37017=124612618|37=80142490394|288=72|290=17|

1128=9|35=X|34=732300|52=20130710124612638|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371192|270=31|273=124612634|271=300|272=20130710|  
 37016=20130710|37017=124612633|37=80142490395|289=72|290=325|

1128=9|35=X|34=732301|52=20130710124612792|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64788|270=5.37|273=124612788|271=2000|272=20130710|  
 0|37016=20130710|37017=124612787|37=80142490396|288=39|290=18|

1128=9|35=X|34=732302|52=20130710124612976|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64789|270=5.71|273=124612972|271=1000|272=20130710|  
 0|37016=20130710|37017=124612971|37=80142490397|289=39|290=10|

1128=9|35=X|34=732303|52=20130710124613003|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53245|270=1.99|273=124612999|271=3000|272=20130710|  
 0|37016=20130710|37017=124612999|37=80142490398|289=114|290=100|

1128=9|35=X|34=732304|52=20130710124613148|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74084|270=7|273=124613143|271=100|272=20130710|37  
 016=20130710|37017=124613143|37=80142490399|289=72|290=32|

1128=9|35=X|34=732305|52=20130710124613160|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74085|270=6.6|273=124613156|271=200|272=20130710|  
 37016=20130710|37017=124613156|37=80142490400|288=72|290=4|279=0|269=4|22=8|  
 207=BVMF|48=3809654|83=74086|270=6.56|273=124613156|271=7000|272=20130710|2  
 86=5|279=0|269=A|22=8|207=BVMF|48=3809654|83=74087|273=124613156|271=2000|2  
 72=20130710|277=Q|

1128=9|35=X|34=732306|52=20130710124613240|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53246|270=2.11|273=124613235|271=3000|272=2013071  
 0|37016=20130710|37017=124613235|37=80142490401|289=114|290=127|

1128=9|35=X|34=732307|52=20130710124613461|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371193|270=46.37|273=124613457|271=400|272=201307  
 10|37016=20130710|37017=124613456|37=80142490403|289=114|290=791|

1128=9|35=X|34=732308|52=20130710124613556|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64790|270=5.98|273=124613551|271=500|272=20130710|  
 37016=20130710|37017=124613551|37=80142490404|289=39|290=22|

1128=9|35=X|34=732309|52=20130710124613728|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74088|270=6.5|273=124613724|271=100|272=20130710|  
 37016=20130710|37017=124613724|37=80142490405|288=72|290=28|

1128=9|35=X|34=732310|52=20130710124613744|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74089|270=7|273=124613740|271=600|272=20130710|37  
 016=20130710|37017=124613740|37=80142490406|289=72|290=33|

1128=9|35=X|34=732311|52=20130710124613791|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64791|270=5.4|273=124613787|271=5400|272=20130710|  
 37016=20130710|37017=124613787|37=80142490407|288=39|290=18|

1128=9|35=X|34=732312|52=20130710124613830|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74090|270=5.75|273=124613826|271=1000|272=2013071  
 0|37016=20130710|37017=124613826|37=80142490408|288=72|290=95|

1128=9|35=X|34=732313|52=20130710124613844|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3809779|83=27905|270=6.82|273=124613840|271=200|272=20130710|  
 37016=20130710|37017=124613840|37=80142490409|289=72|290=1|279=0|269=4|22=8|  
 207=BVMF|48=3809779|83=27906|270=6.98|273=124613840|271=200|272=20130710|28  
 6=5|279=0|269=A|22=8|207=BVMF|48=3809779|83=27907|273=124613840|271=1300|27  
 2=20130710|277=P|

1128=9|35=X|34=732314|52=20130710124613888|75=20130708|268=2|279=2|269=0|22  
 =8|207=BVMF|48=3809639|83=371194|273=124613883|272=20130710|37=80141639492|  
 288=114|290=218|279=0|269=0|22=8|207=BVMF|48=3809639|83=371195|270=23.5|273  
 =124613883|271=4000|272=20130710|37016=20130710|37017=124613883|37=80142490  
 410|288=114|290=225|

1128=9|35=X|34=732315|52=20130710124613906|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64792|270=5.65|273=124613902|271=700|272=20130710|  
 37016=20130710|37017=124613902|37=80142490411|289=72|290=7|

1128=9|35=X|34=732316|52=20130710124613970|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64793|270=5.46|273=124613965|271=100|272=20130710|  
 37016=20130710|37017=124613965|37=80142490412|288=102|290=3|

1128=9|35=X|34=732317|52=20130710124614228|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11839|270=25.94|273=124614223|271=60|272=20130710|  
 37016=20130710|37017=124614223|37=80142490414|288=102|290=13|

1128=9|35=X|34=732318|52=20130710124614271|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371196|270=25.9|273=124614267|271=100|272=2013071  
 0|37016=20130710|37017=124614266|37=80142490415|288=102|290=39|

1128=9|35=X|34=732319|52=20130710124614386|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809688|83=237542|270=30.3|273=124614382|271=100|272=2013071  
 0|37016=20130710|37017=124614382|37=80142490416|289=72|290=6|

1128=9|35=X|34=732320|52=20130710124614401|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53247|270=1.65|273=124614397|271=2000|272=2013071  
 0|37016=20130710|37017=124614397|37=80142490417|289=72|290=19|

1128=9|35=X|34=732321|52=20130710124614596|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64794|270=5.4|273=124614591|271=200|272=20130710|  
 37016=20130710|37017=124614591|37=80142490419|288=39|290=20|

1128=9|35=X|34=732322|52=20130710124614963|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803947|83=72200|270=15.5|273=124614959|271=3100|272=2013071  
 0|37016=20130710|37017=124614958|37=80142490420|288=39|290=8|

1128=9|35=X|34=732323|52=20130710124615338|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64795|270=5.6|273=124615334|271=2400|272=20130710|  
 37016=20130710|37017=124615333|37=80142490421|289=39|290=4|

1128=9|35=X|34=732324|52=20130710124615770|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53248|270=1.8|273=124615766|271=20000|272=2013071  
 0|37016=20130710|37017=124615766|37=80142490422|289=39|290=72|

1128=9|35=X|34=732325|52=20130710124615910|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371197|270=26.75|273=124615906|271=400|272=201307  
 10|37016=20130710|37017=124615905|37=80142490423|289=114|290=16|

1128=9|35=X|34=732326|52=20130710124616093|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371198|270=26|273=124616089|271=100|272=20130710|  
 37016=20130710|37017=124616088|37=80142490424|288=21|290=31|

1128=9|35=X|34=732327|52=20130710124616162|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128748|270=13.3|273=124616157|271=300|272=2013071  
 0|37016=20130710|37017=124616157|37=80142490425|289=39|290=7|

1128=9|35=X|34=732328|52=20130710124616492|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53249|270=1.64|273=124616488|271=34500|272=201307  
 10|37016=20130710|37017=124616487|37=80142490426|289=39|290=16|

1128=9|35=X|34=732329|52=20130710124616822|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64796|270=5.72|273=124616817|271=1700|272=2013071

0|37016=20130710|37017=124616817|37=80142490427|289=102|290=14|  
 1128=9|35=X|34=732330|52=20130710124616905|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64797|270=5.25|273=124616901|271=1700|272=2013071  
 0|37016=20130710|37017=124616900|37=80142490428|288=102|290=32|  
 1128=9|35=X|34=732331|52=20130710124616985|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53250|270=1.23|273=124616981|271=40000|272=2013071  
 10|37016=20130710|37017=124616980|37=80142490429|288=39|290=38|  
 1128=9|35=X|34=732332|52=20130710124617266|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809779|83=27908|270=7.7|273=124617262|271=500|272=20130710|  
 37016=20130710|37017=124617261|37=80142490431|289=39|290=12|  
 1128=9|35=X|34=732333|52=20130710124617873|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53251|270=1.55|273=124617869|271=1500|272=2013071  
 0|37016=20130710|37017=124617868|37=80142490433|288=39|290=3|279=0|269=4|22  
 =8|207=BVMF|48=3805660|83=53252|270=1.54|273=124617869|271=3200|272=2013071  
 0|286=5|279=0|269=A|22=8|207=BVMF|48=3805660|83=53253|273=124617869|271=170  
 00|272=20130710|277=Q|  
 1128=9|35=X|34=732334|52=20130710124618011|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74091|270=6.5|273=124618007|271=2600|272=20130710|  
 37016=20130710|37017=124618006|37=80142490434|288=39|290=29|  
 1128=9|35=X|34=732335|52=20130710124618699|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74092|270=6.57|273=124618694|271=500|272=20130710|  
 37016=20130710|37017=124618694|37=80142490436|288=39|290=9|279=0|269=4|22=8|  
 207=BVMF|48=3809654|83=74093|270=6.56|273=124618694|271=7500|272=20130710|2  
 86=5|279=0|269=A|22=8|207=BVMF|48=3809654|83=74094|273=124618694|271=1500|2  
 72=20130710|277=Q|  
 1128=9|35=X|34=732336|52=20130710124618938|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74095|270=6|273=124618933|271=900|272=20130710|37  
 016=20130710|37017=124618933|37=80142490437|288=39|290=80|  
 1128=9|35=X|34=732337|52=20130710124618985|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371199|270=25.5|273=124618981|271=3900|272=20130710|  
 10|37016=20130710|37017=124618980|37=80142490438|288=102|290=80|  
 1128=9|35=X|34=732338|52=20130710124619249|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3863917|83=3814|270=5.48|273=124619244|271=65|272=20130710|3  
 7016=20130710|37017=124619244|37=80142490439|288=10|290=1|  
 1128=9|35=X|34=732339|52=20130710124619477|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74096|270=5.8|273=124619472|271=3000|272=20130710|  
 37016=20130710|37017=124619472|37=80142490440|288=39|290=94|  
 1128=9|35=X|34=732340|52=20130710124619760|75=20130710|268=1|279=0|269=0|22

=8|207=BVMF|48=3809639|83=371200|270=26.1|273=124619756|271=300|272=2013071  
0|37016=20130710|37017=124619755|37=80142490441|288=39|290=10|

1128=9|35=X|34=732341|52=20130710124620291|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809654|83=74097|270=7.09|273=124620287|271=500|272=20130710|  
37016=20130710|37017=124620286|37=80142490442|289=39|290=38|

1128=9|35=X|34=732342|52=20130710124620454|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=4002234|83=11840|270=26|273=124620449|271=10|272=20130710|37  
016=20130710|37017=124620449|37=80142490443|288=114|290=12|

1128=9|35=X|34=732343|52=20130710124620645|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805660|83=53254|270=1.52|273=124620640|271=3000|272=2013071  
0|37016=20130710|37017=124620640|37=80142490444|288=129|290=9|

1128=9|35=X|34=732344|52=20130710124620736|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371201|270=26.07|273=124620732|271=100|272=201307  
10|37016=20130710|37017=124620731|37=80142490445|288=39|290=11|

1128=9|35=X|34=732345|52=20130710124621118|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371202|270=26|273=124621113|271=1000|272=20130710|  
37016=20130710|37017=124621112|37=80142490447|288=39|290=34|

1128=9|35=X|34=732346|52=20130710124621411|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371203|270=26.07|273=124621406|271=200|272=201307  
10|37016=20130710|37017=124621405|37=80142490448|288=39|290=12|

1128=9|35=X|34=732347|52=20130710124622045|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371204|270=25.95|273=124622040|271=500|272=201307  
10|37016=20130710|37017=124622039|37=80142490449|288=39|290=40|

1128=9|35=X|34=732348|52=20130710124622223|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371205|270=25|273=124622219|271=2000|272=20130710|  
37016=20130710|37017=124622218|37=80142490450|288=39|290=170|

1128=9|35=X|34=732349|52=20130710124622820|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371206|270=26|273=124622816|271=1000|272=20130710|  
37016=20130710|37017=124622815|37=80142490451|288=39|290=36|

1128=9|35=X|34=732350|52=20130710124622949|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805587|83=449|270=0.5|273=124622944|271=300|272=20130710|37  
016=20130710|37017=124622944|37=80142490452|288=39|290=2|

1128=9|35=X|34=732351|52=20130710124623483|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74098|270=6.54|273=124623478|271=100|272=20130710|  
37016=20130710|37017=124623478|37=80142490453|288=21|290=13|

1128=9|35=X|34=732352|52=20130710124623923|75=20130710|268=2|279=0|269=0|22  
=8|207=BVMF|48=3897741|83=4798|270=12.9|273=124623918|271=80|272=20130710|3  
7016=20130710|37017=124623918|37=80142490455|288=39|290=3|279=0|269=A|22=8|

207=BVMF|48=389774|83=4799|273=124623918|271=153|272=20130710|277=P|

1128=9|35=X|34=732353|52=20130710124624698|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809654|83=74099|270=7|273=124624693|271=500|272=20130710|37  
016=20130710|37017=124624693|37=80142490458|289=21|290=34|

1128=9|35=X|34=732354|52=20130710124625168|75=20130701|268=1|279=2|269=1|22  
=8|207=BVMF|48=3802493|83=64798|273=124625164|272=20130710|37=80132531704|2  
89=114|290=51|

1128=9|35=X|34=732355|52=20130710124627164|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3803913|83=128749|270=13.33|273=124627160|271=700|272=201307  
10|37016=20130710|37017=124627159|37=80142490467|289=114|290=8|

1128=9|35=X|34=732356|52=20130710124627320|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803889|83=11207|270=11.4|273=124627316|271=200|272=20130710|  
37016=20130710|37017=124627316|37=80142490468|288=21|290=2|

1128=9|35=X|34=732357|52=20130710124627501|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74100|270=6.5|273=124627496|271=200|272=20130710|  
37016=20130710|37017=124627496|37=80142490470|288=21|290=32|

1128=9|35=X|34=732358|52=20130710124628397|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809639|83=371207|270=26.97|273=124628393|271=1900|272=201307  
10|37016=20130710|37017=124628392|37=80142490471|289=21|290=23|

1128=9|35=X|34=732359|52=20130710124628403|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=4002234|83=11841|270=26.97|273=124628398|271=50|272=20130710|  
37016=20130710|37017=124628398|37=80142490472|289=21|290=11|

1128=9|35=X|34=732360|52=20130710124628566|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3805660|83=53255|270=1.52|273=124628562|271=300|272=20130710|  
37016=20130710|37017=124628561|37=80142490473|288=114|290=10|

1128=9|35=X|34=732361|52=20130710124629110|75=20130605|268=1|279=2|269=0|22  
=8|207=BVMF|48=3802493|83=64799|273=124629106|272=20130710|37=8093369752|28  
8=23|290=104|

1128=9|35=X|34=732362|52=20130710124630132|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809639|83=371208|270=26.68|273=124630127|271=100|272=201307  
10|37016=20130710|37017=124630127|37=80142490476|289=114|290=11|

1128=9|35=X|34=732363|52=20130710124630277|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809654|83=74101|270=5.5|273=124630272|271=5000|272=20130710|  
37016=20130710|37017=124630272|37=80142490478|288=21|290=150|

1128=9|35=X|34=732364|52=20130710124630472|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809688|83=237543|270=26|273=124630468|271=100|272=20130710|  
37016=20130710|37017=124630468|37=80142490479|288=114|290=13|

1128=9|35=X|34=732365|52=20130710124632995|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809779|83=27909|270=7.6|273=124632990|271=100|272=20130710|  
 37016=20130710|37017=124632990|37=80142490489|289=131|290=11|

1128=9|35=X|34=732366|52=20130710124633135|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74102|270=6.75|273=124633130|271=700|272=20130710|  
 37016=20130710|37017=124633130|37=80142490490|289=114|290=9|

1128=9|35=X|34=732367|52=20130710124634757|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53256|270=1.49|273=124634753|271=2000|272=2013071  
 0|37016=20130710|37017=124634753|37=80142490492|288=129|290=12|

1128=9|35=X|34=732368|52=20130710124635014|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805579|83=742|270=2|273=124635009|271=5000|272=20130710|370  
 16=20130710|37017=124635009|37=80142490493|289=129|290=21|

1128=9|35=X|34=732369|52=20130710124635172|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64800|270=5.4|273=124635167|271=2500|272=20130710|  
 37016=20130710|37017=124635167|37=80142490494|288=21|290=21|

1128=9|35=X|34=732370|52=20130710124635793|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809688|83=237544|270=28.32|273=124635789|271=200|272=201307  
 10|37016=20130710|37017=124635789|37=80142490495|288=147|290=31|

1128=9|35=X|34=732371|52=20130710124636928|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53257|270=1.79|273=124636924|271=2000|272=2013071  
 0|37016=20130710|37017=124636923|37=80142490496|289=114|290=64|

1128=9|35=X|34=732372|52=20130710124638199|75=20130710|268=2|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11842|270=30|273=124638194|271=4|272=20130710|370  
 16=20130710|37017=124638194|37=80142490501|288=47|290=1|279=0|269=A|22=8|20  
 7=BVMF|48=4002234|83=11843|273=124638194|271=30|272=20130710|277=PI

1128=9|35=X|34=732373|52=20130710124638375|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128750|270=16.1|273=124638371|271=300|272=2013071  
 0|37016=20130710|37017=124638371|37=80142490502|289=114|290=167|

1128=9|35=X|34=732374|52=20130710124639217|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3897741|83=4800|270=13.1|273=124639213|271=78|272=20130710|3  
 7016=20130710|37017=124639213|37=80142490506|289=114|290=31|

1128=9|35=X|34=732375|52=20130710124639289|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371209|270=26.29|273=124639285|271=100|272=201307  
 10|37016=20130710|37017=124639284|37=80142490507|288=114|290=5|

1128=9|35=X|34=732376|52=20130710124639333|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809779|83=27910|270=6.9|273=124639329|271=700|272=20130710|  
 37016=20130710|37017=124639329|37=80142490508|288=21|290=21|

1128=9|35=X|34=732377|52=20130710124639493|75=20130710|268=1|279=0|269=1|22

=8|207=BVMF|48=3809779|83=27911|270=11.9|273=124639489|271=300|272=20130710|  
37016=20130710|37017=124639489|37=80142490509|289=114|290=43|

1128=9|35=X|34=732378|52=20130710124640072|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809639|83=371210|270=35.8|273=124640067|271=600|272=2013071  
0|37016=20130710|37017=124640066|37=80142490510|289=114|290=630|

1128=9|35=X|34=732379|52=20130710124640232|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53258|270=1.97|273=124640228|271=2000|272=2013071  
0|37016=20130710|37017=124640228|37=80142490511|289=114|290=101|

1128=9|35=X|34=732380|52=20130710124640324|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809654|83=74103|270=6.91|273=124640320|271=600|272=20130710|  
37016=20130710|37017=124640320|37=80142490512|289=21|290=21|

1128=9|35=X|34=732381|52=20130710124641562|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64801|270=4.92|273=124641557|271=6500|272=2013071  
0|37016=20130710|37017=124641557|37=80142490516|288=114|290=87|

1128=9|35=X|34=732382|52=20130710124641698|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3802493|83=64802|270=6.45|273=124641694|271=600|272=20130710|  
37016=20130710|37017=124641694|37=80142490517|289=114|290=55|

1128=9|35=X|34=732383|52=20130710124641979|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3803913|83=128751|270=13.3|273=124641974|271=1000|272=201307  
10|37016=20130710|37017=124641974|37=80142490518|289=114|290=81|

1128=9|35=X|34=732384|52=20130710124642227|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53259|270=1.78|273=124642222|271=2700|272=2013071  
0|37016=20130710|37017=124642222|37=80142490519|289=114|290=61|

1128=9|35=X|34=732385|52=20130710124642981|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809654|83=74104|270=7.45|273=124642976|271=1200|272=2013071  
0|37016=20130710|37017=124642976|37=80142490521|289=114|290=82|

1128=9|35=X|34=732386|52=20130710124643204|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809688|83=237545|270=28|273=124643199|271=300|272=20130710|  
37016=20130710|37017=124643199|37=80142490523|288=21|290=71|

1128=9|35=X|34=732387|52=20130710124643307|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809639|83=371211|270=27.6|273=124643303|271=100|272=2013071  
0|37016=20130710|37017=124643302|37=80142490524|289=72|290=80|

1128=9|35=X|34=732388|52=20130710124643339|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53260|270=1.65|273=124643335|271=1500|272=2013071  
0|37016=20130710|37017=124643335|37=80142490525|289=114|290=21|

1128=9|35=X|34=732389|52=20130710124643911|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3809779|83=27912|270=6.99|273=124643906|271=1000|272=2013071  
0|37016=20130710|37017=124643906|37=80142490526|288=86|290=1|279=0|269=4|22

=8|207=BVMF|48=3809779|83=27913|270=6.99|273=124643906|271=200|272=20130710|  
 286=5|279=0|269=A|22=8|207=BVMF|48=3809779|83=27914|273=124643906|271=800|2  
 72=20130710|277=PI

1128=9|35=X|34=732390|52=20130710124644156|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371212|270=25.95|273=124644151|271=1000|272=20130  
 710|37016=20130710|37017=124644151|37=80142490527|288=21|290=43|

1128=9|35=X|34=732391|52=20130710124644811|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371213|270=25|273=124644807|271=200|272=20130710|  
 37016=20130710|37017=124644806|37=80142490528|288=114|290=174|

1128=9|35=X|34=732392|52=20130710124646092|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74105|270=8.2|273=124646087|271=2000|272=20130710|  
 37016=20130710|37017=124646087|37=80142490529|289=82|290=159|

1128=9|35=X|34=732393|52=20130710124646148|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53261|270=1.49|273=124646143|271=2000|272=2013071  
 0|37016=20130710|37017=124646143|37=80142490530|288=129|290=13|

1128=9|35=X|34=732394|52=20130710124646647|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64803|270=5.7|273=124646642|271=800|272=20130710|  
 37016=20130710|37017=124646642|37=80142490532|289=21|290=12|

1128=9|35=X|34=732395|52=20130710124647387|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11844|270=26|273=124647382|271=19|272=20130710|37  
 016=20130710|37017=124647382|37=80142490533|288=114|290=14|

1128=9|35=X|34=732396|52=20130710124647751|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371214|270=27.5|273=124647746|271=500|272=2013071  
 0|37016=20130710|37017=124647745|37=80142490536|289=21|290=78|

1128=9|35=X|34=732397|52=20130710124647756|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53262|270=1.65|273=124647751|271=5000|272=2013071  
 0|37016=20130710|37017=124647751|37=80142490537|289=21|290=22|

1128=9|35=X|34=732398|52=20130710124647813|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371215|270=26.07|273=124647809|271=400|272=201307  
 10|37016=20130710|37017=124647808|37=80142490538|288=114|290=14|

1128=9|35=X|34=732399|52=20130710124647852|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53263|270=1.6|273=124647848|271=5000|272=20130710|  
 37016=20130710|37017=124647848|37=80142490539|289=21|290=11|

1128=9|35=X|34=732400|52=20130710124648008|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809779|83=27915|270=7.49|273=124648003|271=2000|272=2013071  
 0|37016=20130710|37017=124648003|37=80142490540|289=114|290=71|

1128=9|35=X|34=732401|52=20130710124648108|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74106|270=6.7|273=124648103|271=100|272=20130710|

37016=20130710|37017=124648103|37=80142490541|289=74|290=5|

1128=9|35=X|34=732402|52=20130710124648111|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3803913|83=128752|270=12.8|273=124648107|271=100|272=2013071  
0|37016=20130710|37017=124648107|37=80142490542|288=74|290=16|

1128=9|35=X|34=732403|52=20130710124648175|75=20130710|268=3|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371216|270=26.4|273=124648170|271=100|272=2013071  
0|37016=20130710|37017=124648169|37=80142490544|288=27|290=5|279=0|269=4|22  
=8|207=BVMF|48=3809639|83=371217|270=26.39|273=124648170|271=16700|272=2013  
0710|286=5|279=0|269=A|22=8|207=BVMF|48=3809639|83=371218|273=124648170|271  
=41500|272=20130710|277=Q|

1128=9|35=X|34=732404|52=20130710124648642|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3805660|83=53264|270=1.62|273=124648638|271=5000|272=2013071  
0|37016=20130710|37017=124648638|37=80142490546|289=21|290=14|

1128=9|35=X|34=732405|52=20130710124648754|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64804|270=4.9|273=124648749|271=200|272=20130710|  
37016=20130710|37017=124648749|37=80142490547|288=21|290=91|

1128=9|35=X|34=732406|52=20130710124649107|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=4002234|83=11845|270=31.52|273=124649103|271=42|272=20130710|  
37016=20130710|37017=124649102|37=80142490548|289=74|290=68|

1128=9|35=X|34=732407|52=20130710124649108|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3940418|83=67|270=1.79|273=124649103|271=70|272=20130710|370  
16=20130710|37017=124649103|37=80142490549|288=74|290=11|

1128=9|35=X|34=732408|52=20130710124649621|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3802493|83=64805|270=5.3|273=124649617|271=800|272=20130710|  
37016=20130710|37017=124649617|37=80142490550|288=21|290=28|

1128=9|35=X|34=732409|52=20130710124649639|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371219|270=26|273=124649634|271=1000|272=20130710|  
37016=20130710|37017=124649634|37=80142490551|288=114|290=40|

1128=9|35=X|34=732410|52=20130710124649691|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371220|270=20|273=124649686|271=1000|272=20130710|  
37016=20130710|37017=124649685|37=80142490552|288=21|290=278|

1128=9|35=X|34=732411|52=20130710124650301|75=20130710|268=1|279=0|269=1|22  
=8|207=BVMF|48=3809654|83=74107|270=7.08|273=124650296|271=500|272=20130710|  
37016=20130710|37017=124650296|37=80142490553|289=114|290=41|

1128=9|35=X|34=732412|52=20130710124650515|75=20130710|268=2|279=0|269=1|22  
=8|207=BVMF|48=3809688|83=237546|270=29.45|273=124650511|271=300|272=201307  
10|37016=20130710|37017=124650511|37=80142490554|289=10|290=2|279=0|269=A|2  
2=8|207=BVMF|48=3809688|83=237547|273=124650511|271=2200|272=20130710|277=Q|

1128=9|35=X|34=732413|52=20130710124651106|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53265|270=1.66|273=124651101|271=300|272=20130710|  
 37016=20130710|37017=124651101|37=80142490556|289=74|290=30|

1128=9|35=X|34=732414|52=20130710124651108|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128753|270=12.91|273=124651104|271=200|272=201307  
 10|37016=20130710|37017=124651103|37=80142490557|288=74|290=10|

1128=9|35=X|34=732415|52=20130710124651594|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3802493|83=64806|270=6|273=124651590|271=200|272=20130710|37  
 016=20130710|37017=124651590|37=80142490559|289=21|290=35|

1128=9|35=X|34=732416|52=20130710124652108|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74108|270=7.5|273=124652104|271=100|272=20130710|  
 37016=20130710|37017=124652103|37=80142490560|289=74|290=91|

1128=9|35=X|34=732417|52=20130710124652687|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53266|270=1.61|273=124652682|271=10000|272=201307  
 10|37016=20130710|37017=124652682|37=80142490561|289=90|290=12|

1128=9|35=X|34=732418|52=20130710124653066|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53267|270=1.67|273=124653061|271=9200|272=2013071  
 0|37016=20130710|37017=124653061|37=80142490562|289=23|290=33|

1128=9|35=X|34=732419|52=20130710124653071|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53268|270=1.71|273=124653066|271=8900|272=2013071  
 0|37016=20130710|37017=124653066|37=80142490563|289=23|290=44|

1128=9|35=X|34=732420|52=20130710124653076|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53269|270=1.75|273=124653071|271=8700|272=2013071  
 0|37016=20130710|37017=124653071|37=80142490564|289=23|290=61|

1128=9|35=X|34=732421|52=20130710124653080|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53270|270=1.8|273=124653075|271=8500|272=20130710|  
 37016=20130710|37017=124653075|37=80142490565|289=23|290=85|

1128=9|35=X|34=732422|52=20130710124653085|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53271|270=1.84|273=124653080|271=8300|272=2013071  
 0|37016=20130710|37017=124653080|37=80142490566|289=23|290=93|

1128=9|35=X|34=732423|52=20130710124653091|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53272|270=1.89|273=124653087|271=8100|272=2013071  
 0|37016=20130710|37017=124653086|37=80142490567|289=23|290=102|

1128=9|35=X|34=732424|52=20130710124653108|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74109|270=7.24|273=124653103|271=2600|272=2013071  
 0|37016=20130710|37017=124653103|37=80142490568|289=74|290=64|

1128=9|35=X|34=732425|52=20130710124653676|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803889|83=11208|270=11.8|273=124653672|271=100|272=20130710|

37016=20130710|37017=124653671|37=80142490570|289=21|290=1|

1128=9|35=X|34=732426|52=20130710124653711|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3809688|83=237548|270=29|273=124653707|271=200|272=20130710|  
 37016=20130710|37017=124653707|37=80142490571|289=21|290=1|279=0|269=4|22=8|  
 207=BVMF|48=3809688|83=237549|270=29|273=124653707|271=100|272=20130710|286  
 =5|279=0|269=A|22=8|207=BVMF|48=3809688|83=237550|273=124653707|271=100|272  
 =20130710|277=Q|

1128=9|35=X|34=732427|52=20130710124653814|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=4002184|83=5091|270=29|273=124653810|271=8|272=20130710|3701  
 6=20130710|37017=124653810|37=80142490572|289=21|290=1|

1128=9|35=X|34=732428|52=20130710124653832|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74110|270=6.89|273=124653828|271=2000|272=2013071  
 0|37016=20130710|37017=124653828|37=80142490573|289=114|290=18|

1128=9|35=X|34=732429|52=20130710124655106|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371221|270=26|273=124655102|271=100|272=20130710|  
 37016=20130710|37017=124655101|37=80142490574|288=74|290=41|

1128=9|35=X|34=732430|52=20130710124655106|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3806536|83=14286|270=3.74|273=124655102|271=200|272=20130710|  
 37016=20130710|37017=124655102|37=80142490575|288=74|290=9|

1128=9|35=X|34=732431|52=20130710124655107|75=20130710|268=2|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11846|270=26.1|273=124655103|271=60|272=20130710|  
 37016=20130710|37017=124655103|37=80142490576|288=74|290=6|279=0|269=A|22=8|  
 207=BVMF|48=4002234|83=11847|273=124655103|271=90|272=20130710|277=P|

1128=9|35=X|34=732432|52=20130710124655235|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3897741|83=4801|270=12.5|273=124655230|271=25|272=20130710|  
 37016=20130710|37017=124655230|37=80142490578|288=114|290=9|

1128=9|35=X|34=732433|52=20130710124655638|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128754|270=12.2|273=124655633|271=400|272=2013071  
 0|37016=20130710|37017=124655633|37=80142490579|288=21|290=55|

1128=9|35=X|34=732434|52=20130710124656105|75=20130710|268=2|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11848|270=26.5|273=124656101|271=5|272=20130710|3  
 7016=20130710|37017=124656100|37=80142490580|288=74|290=3|279=0|269=A|22=8|  
 207=BVMF|48=4002234|83=11849|273=124656101|271=95|272=20130710|277=P|

1128=9|35=X|34=732435|52=20130710124656105|75=20130710|268=2|279=0|269=0|22  
 =8|207=BVMF|48=3897741|83=4802|270=13.3|273=124656101|271=5|272=20130710|37  
 016=20130710|37017=124656101|37=80142490581|288=74|290=1|279=0|269=A|22=8|2  
 07=BVMF|48=3897741|83=4803|273=124656101|271=158|272=20130710|277=P|

1128=9|35=X|34=732436|52=20130710124656637|75=20130710|268=3|279=0|269=1|22

=8|207=BVMF|48=4002234|83=11850|270=26.05|273=124656633|271=40|272=20130710|  
 37016=20130710|37017=124656633|37=80142490583|289=21|290=3|279=0|269=4|22=8|  
 207=BVMF|48=4002234|83=11851|270=26.1|273=124656633|271=110|272=20130710|28  
 6=5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11852|273=124656633|271=55|272=20130710|277=PI

1128=9|35=X|34=732437|52=20130710124656824|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64807|270=5.41|273=124656820|271=2000|272=20130710|37016=20130710|37017=124656820|37=80142490584|288=114|290=11|

1128=9|35=X|34=732438|52=20130710124657070|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3997293|83=2837|270=6.01|273=124657066|271=50|272=20130710|37016=20130710|37017=124657065|37=80142490585|288=114|290=13|

1128=9|35=X|34=732439|52=20130710124657318|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11853|270=25.01|273=124657313|271=25|272=20130710|37016=20130710|37017=124657313|37=80142490587|288=114|290=45|

1128=9|35=X|34=732440|52=20130710124659138|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74111|270=7.15|273=124659133|271=2000|272=20130710|37016=20130710|37017=124659133|37=80142490589|289=114|290=53|

1128=9|35=X|34=732441|52=20130710124659550|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64808|270=5.38|273=124659545|271=5000|272=20130710|37016=20130710|37017=124659545|37=80142490590|288=114|290=23|

1128=9|35=X|34=732442|52=20130710124701549|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11854|270=26.02|273=124701544|271=7|272=20130710|37016=20130710|37017=124701544|37=80142490592|288=114|290=8|

1128=9|35=X|34=732443|52=20130710124702575|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128755|270=12.9|273=124702570|271=1300|272=20130710|37016=20130710|37017=124702570|37=80142490594|288=114|290=13|

1128=9|35=X|34=732444|52=20130710124703062|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3863917|83=3815|270=5.6|273=124703058|271=48|272=20130710|37016=20130710|37017=124703058|37=80142490596|288=21|290=1|

1128=9|35=X|34=732445|52=20130710124704019|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53273|270=1.55|273=124704015|271=900|272=20130710|37016=20130710|37017=124704014|37=80142490599|288=114|290=4|279=0|269=4|22=8|207=BVMF|48=3805660|83=53274|270=1.54|273=124704015|271=4100|272=20130710|286=5|279=0|269=A|22=8|207=BVMF|48=3805660|83=53275|273=124704015|271=16100|272=20130710|277=QI

1128=9|35=X|34=732446|52=20130710124704208|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64809|270=5.41|273=124704204|271=4000|272=20130710|37016=20130710|37017=124704204|37=80142490600|288=114|290=12|

1128=9|35=X|34=732447|52=20130710124704375|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64810|270=5.35|273=124704371|271=100|272=20130710|  
 37016=20130710|37017=124704371|37=80142490601|288=21|290=28|

1128=9|35=X|34=732448|52=20130710124704757|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128756|273=124704753|271=1500|272=20130710|37016=  
 20130710|37017=124704753|37=80142490602|289=86|290=1|279=0|269=4|22=8|207=B  
 VMF|48=3803913|83=128757|270=12.95|273=124704753|271=1900|272=20130710|286=  
 5|279=0|269=A|22=8|207=B VMF|48=3803913|83=128758|273=124704753|271=100|272=  
 20130710|277=Q|

1128=9|35=X|34=732449|52=20130710124704949|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53276|270=1.6|273=124704944|271=10000|272=2013071  
 0|37016=20130710|37017=124704944|37=80142490603|289=114|290=12|

1128=9|35=X|34=732450|52=20130710124705419|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371222|270=25.7|273=124705414|271=400|272=2013071  
 0|37016=20130710|37017=124705413|37=80142490604|288=21|290=61|

1128=9|35=X|34=732451|52=20130710124705501|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371223|270=25.44|273=124705497|271=300|272=201307  
 10|37016=20130710|37017=124705496|37=80142490606|288=114|290=97|

1128=9|35=X|34=732452|52=20130710124705948|75=20130710|268=1|279=2|269=1|22  
 =8|207=BVMF|48=3805660|83=53277|273=124705943|272=20130710|37=80142490381|2  
 89=72|290=61|

1128=9|35=X|34=732453|52=20130710124706094|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803889|83=11209|270=11.1|273=124706089|271=1500|272=2013071  
 0|37016=20130710|37017=124706089|37=80142490608|288=114|290=7|

1128=9|35=X|34=732454|52=20130710124706179|75=20130705|268=2|279=2|269=0|22  
 =8|207=BVMF|48=3809779|83=27916|273=124706175|272=20130710|37=80139671638|2  
 88=114|290=7|279=0|269=0|22=8|207=BVMF|48=3809779|83=27917|270=6.69|273=124  
 706175|271=1000|272=20130710|37016=20130710|37017=124706174|37=80142490609|  
 288=114|290=7|

1128=9|35=X|34=732455|52=20130710124708451|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53278|270=1.55|273=124708446|271=600|272=20130710|  
 37016=20130710|37017=124708446|37=80142490615|288=114|290=5|279=0|269=4|22=8|  
 207=BVMF|48=3805660|83=53279|270=1.54|273=124708446|271=4700|272=20130710|  
 286=5|279=0|269=A|22=8|207=BVMF|48=3805660|83=53280|273=124708446|271=15500|  
 272=20130710|277=Q|

1128=9|35=X|34=732456|52=20130710124709528|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53281|270=1.14|273=124709523|271=400|272=20130710|  
 37016=20130710|37017=124709523|37=80142490616|288=21|290=58|

1128=9|35=X|34=732457|52=20130710124709880|75=20130704|268=1|279=2|269=0|22  
 =8|207=BVMF|48=3805660|83=53282|273=124709876|272=20130710|37=80138036330|2  
 88=114|290=93|

1128=9|35=X|34=732458|52=20130710124710066|75=20130704|268=1|279=2|269=0|22  
 =8|207=BVMF|48=3805660|83=53283|273=124710062|272=20130710|37=80138036012|2  
 88=114|290=96|

1128=9|35=X|34=732459|52=20130710124710159|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371224|270=24.8|273=124710155|271=800|272=2013071  
 0|37016=20130710|37017=124710154|37=80142490618|288=114|290=197|

1128=9|35=X|34=732460|52=20130710124710214|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=4002234|83=11855|270=26.1|273=124710210|271=14|272=20130710|  
 37016=20130710|37017=124710209|37=80142490619|289=114|290=4|279=0|269=4|22=  
 8|207=BVMF|48=4002234|83=11856|270=26.1|273=124710210|271=124|272=20130710|  
 286=5|279=0|269=A|22=8|207=BVMF|48=4002234|83=11857|273=124710210|271=41|27  
 2=20130710|277=P|

1128=9|35=X|34=732461|52=20130710124710406|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128759|270=12.83|273=124710401|271=19000|272=2013  
 0710|37016=20130710|37017=124710401|37=80142490620|288=114|290=16|

1128=9|35=X|34=732462|52=20130710124710833|75=20130612|268=2|279=2|269=0|22  
 =8|207=BVMF|48=3809639|83=371225|273=124710828|272=20130710|37=80103383513|  
 288=114|290=133|279=0|269=0|22=8|207=BVMF|48=3809639|83=371226|270=24.75|27  
 3=124710828|271=200|272=20130710|37016=20130710|37017=124710828|37=80142490  
 621|288=114|290=199|

1128=9|35=X|34=732463|52=20130710124711277|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809688|83=237551|270=32.11|273=124711272|271=100|272=201307  
 10|37016=20130710|37017=124711272|37=80142490622|289=21|290=19|

1128=9|35=X|34=732464|52=20130710124711381|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3805660|83=53284|270=1.61|273=124711377|271=11500|272=201307  
 10|37016=20130710|37017=124711376|37=80142490623|289=21|290=14|

1128=9|35=X|34=732465|52=20130710124711560|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3805660|83=53285|270=1.41|273=124711555|271=11500|272=201307  
 10|37016=20130710|37017=124711555|37=80142490624|288=21|290=25|

1128=9|35=X|34=732466|52=20130710124711606|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3809654|83=74112|270=6.6|273=124711601|271=2000|272=20130710|  
 37016=20130710|37017=124711601|37=80142490625|288=114|290=5|279=0|269=4|22=  
 8|207=BVMF|48=3809654|83=74113|270=6.58|273=124711601|271=9000|272=20130710|  
 286=5|279=2|269=A|22=8|207=BVMF|48=3809654|83=74114|273=124711601|272=20130  
 710|

1128=9|35=X|34=732467|52=20130710124711887|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371227|270=30.68|273=124711882|271=2700|272=20130  
 710|37016=20130710|37017=124711882|37=80142490626|289=21|290=296|

1128=9|35=X|34=732468|52=20130710124712018|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371228|270=31.1|273=124712014|271=2800|272=20130  
 10|37016=20130710|37017=124712013|37=80142490627|289=21|290=336|

1128=9|35=X|34=732469|52=20130710124712977|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371229|270=32.55|273=124712972|271=1100|272=20130  
 710|37016=20130710|37017=124712971|37=80142490629|289=21|290=434|

1128=9|35=X|34=732470|52=20130710124713071|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3803913|83=128760|270=14.91|273=124713067|271=2100|272=20130  
 710|37016=20130710|37017=124713066|37=80142490630|289=21|290=118|

1128=9|35=X|34=732471|52=20130710124714797|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371230|270=22|273=124714792|271=400|272=20130710|  
 37016=20130710|37017=124714792|37=80142490631|288=21|290=272|

1128=9|35=X|34=732472|52=20130710124716024|75=20130710|268=2|279=2|269=1|22  
 =8|207=BVMF|48=3805660|83=53286|273=124716019|272=20130710|37=80142490519|2  
 89=114|290=71|279=0|269=1|22=8|207=BVMF|48=3805660|83=53287|270=1.69|273=12  
 4716019|271=2700|272=20130710|37016=20130710|37017=124716019|37=80142490632|  
 289=114|290=39|

1128=9|35=X|34=732473|52=20130710124722321|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371231|270=31.5|273=124722316|271=600|272=2013071  
 0|37016=20130710|37017=124722315|37=80142490635|289=21|290=357|

1128=9|35=X|34=732474|52=20130710124723713|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64811|270=5.15|273=124723708|271=2000|272=2013071  
 0|37016=20130710|37017=124723708|37=80142490636|288=129|290=52|

1128=9|35=X|34=732475|52=20130710124724187|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809779|83=27918|270=10|273=124724182|271=300|272=20130710|3  
 7016=20130710|37017=124724182|37=80142490637|289=21|290=35|

1128=9|35=X|34=732476|52=20130710124724272|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809654|83=74115|270=10|273=124724268|271=400|272=20130710|3  
 7016=20130710|37017=124724268|37=80142490638|289=21|290=300|

1128=9|35=X|34=732477|52=20130710124727961|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3809688|83=237552|273=124727956|271=9600|272=20130710|37016=20130710|37017=124727955|37=80142490642|288=8|290=1|279=0|269=4|22=8|207=BVMF|48=3809688|83=237553|270=29.99|273=124727956|271=9700|272=20130710|286=5|279=0|269=A|22=8|207=BVMF|48=3809688|83=237554|273=124727956|271=200|272=20130710|277=Q|

1128=9|35=X|34=732478|52=20130710124727990|75=20130710|268=3|279=0|269=0|22  
 =8|207=BVMF|48=3803913|83=128761|270=12.95|273=124727985|271=2000|272=20130  
 710|37016=20130710|37017=124727985|37=80142490643|288=21|290=7|279=0|269=41  
 22=8|207=BVMF|48=3803913|83=128762|270=12.95|273=124727985|271=2000|272=201  
 30710|286=5|279=0|269=A|22=8|207=BVMF|48=3803913|83=128763|273=124727985|27  
 1=1900|272=20130710|277=Pl

1128=9|35=X|34=732479|52=20130710124730793|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64812|270=5.45|273=124730788|271=100|272=20130710|  
 37016=20130710|37017=124730788|37=80142490647|288=21|290=6|

1128=9|35=X|34=732480|52=20130710124730819|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809779|83=27919|270=6.59|273=124730814|271=300|272=20130710|  
 37016=20130710|37017=124730814|37=80142490648|288=21|290=10|

1128=9|35=X|34=732481|52=20130710124735362|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3802493|83=64813|270=5.46|273=124735358|271=1600|272=2013071  
 0|37016=20130710|37017=124735358|37=80142490650|288=21|290=41|

1128=9|35=X|34=732482|52=20130710124735524|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3991213|83=68|270=90|273=124735519|271=20|272=20130710|37016  
 =20130710|37017=124735519|37=80142490651|288=21|290=11|

1128=9|35=X|34=732483|52=20130710124736264|75=20130710|268=3|279=0|269=1|22  
 =8|207=BVMF|48=3809688|83=237555|273=124736259|271=9600|272=20130710|37016=  
 20130710|37017=124736259|37=80142490652|289=8|290=1|279=0|269=4|22=8|207=B  
 V  
 MF|48=3809688|83=237556|270=29|273=124736259|271=9700|272=20130710|286=5|27  
 9=0|269=A|22=8|207=BVMF|48=3809688|83=237557|273=124736259|271=100|272=2013  
 0710|277=Q|

1128=9|35=X|34=732484|52=20130710124736326|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371232|270=25.51|273=124736321|271=100|272=201307  
 10|37016=20130710|37017=124736321|37=80142490653|288=21|290=79|

1128=9|35=X|34=732485|52=20130710124736890|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=4002234|83=11858|270=25.51|273=124736885|271=80|272=20130710|  
 37016=20130710|37017=124736885|37=80142490655|288=21|290=28|

1128=9|35=X|34=732486|52=20130710124737094|75=20130710|268=1|279=0|269=0|22  
 =8|207=BVMF|48=3809639|83=371233|270=26|273=124737089|271=3000|272=20130710|  
 37016=20130710|37017=124737088|37=80142490656|288=21|290=42|

1128=9|35=X|34=732487|52=20130710124737962|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371234|270=27|273=124737958|271=100|272=20130710|  
 37016=20130710|37017=124737957|37=80142490657|289=21|290=34|

1128=9|35=X|34=732488|52=20130710124739442|75=20130710|268=1|279=0|269=1|22  
 =8|207=BVMF|48=3809639|83=371235|270=27.25|273=124739437|271=500|272=201307

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10|37016=20130710|37017=124739436|37=80142490658|289=21|290=49|  
1128=9|35=X|34=732489|52=20130710124739447|75=20130710|268=1|279=0|269=0|22  
=8|207=BVMF|48=3809639|83=371236|270=25|273=124739443|271=500|272=20130710|  
37016=20130710|37017=124739442|37=80142490659|288=21|290=182|

