BIBLIOGRAPHY

MENZI, MELANIE B., NGOABAN, RHEA B. March 2008. <u>Analysis of Queueing of Customers Serviced at Landbank-La Trinidad, Benguet</u>. Benguet State University, La Trinidad, Benguet.

Adviser: Marycel H. Toyhacao

ABSTRACT

The study was conducted to determine the arrival distribution, the service time distribution, the operating characteristics and the economic analysis of customers serviced at Landbank-La Trinidad, Benguet. There were 3116 customers who composed the respondents of the study.

The average number of customers who arrived at Landbank-La Trinidad, Benguet were 22/hour and the average customer that the teller can serviced per hour were 14, thus the discrepancy between the customers arrivals and the number of customers serviced by the teller results to the existence of queueing of customers.

In Landbank-La Trinidad, customer arrivals were not scheduled and occurred in an unpredictable manner, a random pattern appeared to exist. Thus to determine the customer arrivals at Landbank-La Trinidad, the Poisson distribution provides a good description of the arrival pattern. The Poisson probability distribution is defined by: $P(X \leq x) = \dfrac{\lambda^x e^{-\lambda}}{x!}$ for x = 0, 1, 2,…….. where $\lambda = 22$ and e = 2.71828.

Customers of Landbank-La Trinidad demand different services. They either deposit, withdraw, update accounts, exchange funds, or pay BIR tax thus, the teller's service time varies. The exponential probability distribution was used to describe the service time. The exponential probability distribution is defined by $f(x) = \mu e^{-\mu t}$ for x ≥ 0 where μ = 14 and e = 2.71828.

Using the assumptions of Poisson arrival and exponential service time, a first-come-first-served queue discipline and two identical servers the operating characteristics were computed. On the average, there were 5 customers in the system (L), the average time a customer spends in the system is 13 minutes (W), on the average, there were 3 customers in the queue waiting for the service (Lq), the average time, a unit spends in the queue waiting for service is 8 minutes (Wq) and the probability that an arriving customer has to wait for service is 69% (Pw).

Adding another teller using the same arrival rate and service rate, three identical servers and a first-in first-out queue discipline. On the average, the number of customers in the system was reduced from 5 to 2 (L), the average time a customer spends in the system is reduced from 13 minutes to 5 minutes (W), on the average, the number of customers in the queue waiting for the service is reduced from 3 to 0.27 (Lq), the average time a unit spends in the queue waiting for service is reduced from 8 minutes to 0.6 minutes (Wq) and the probability that an arriving customer has to wait for service was reduced from 69% to 26% (Pw).

The three-teller system will greatly improve the operating characteristics of the system.

TABLE OF CONTENTS

iv

INTRODUCTION

Background of the Study

Waiting line is part of everyday life. Whether it is waiting at a teller window of a bank, waiting in line at the registrars office during enrollment, waiting in line at a fast food outlet's service counter or cars waiting in line at a traffic light, we spend a lot of waiting. Waiting line situations are undesirable to both parties concerned. This may result to customer's dissatisfaction with the service and may be root of economic losses in business.

Waiting lines form because customers arrive at the servicing function faster than they can be served every single time. This does not mean that the service function is understaffed, rather it means that waiting lines form because customers do not arrive at a constant rate, nor are they all served in an equal amount of time. A waiting line is continually increasing and decreasing in length, and in the long run approaches an average rate of customer arrivals and an average time to serve the customers.

Landbank-La Trinidad, Benguet which is the focus of the study is one of the business establishments that deal with the problems involving in queueing. It is a bank branch under the Landbank of the Philippines. It provides services on financial transactions to the customers with the need of human teller machine based service. It provides financial services, including check encashment or

issuing money in various forms, receiving deposits of money, lending money, updating of account balances and receives payment of BIR tax.

Landbank-La Trinidad illustrates the transient nature of waiting lines. Waiting line occurs at the bank daily and doubles during peak hour that falls on the time interval of 9:00AM-10:00AM; peak day which is Friday and peak date that falls every 20th of the month. The existence of long waiting lines is due to the large number of customers demanding for the teller's service. Customers either deposit, withdraw, update balances, exchange funds or pay BIR tax. However, there are only two tellers who render the service or there is limited number of servers. Since customers demand a different service, it also requires a different service time, the amount of time it takes to serve each individual customer adds to the long waiting lines. This results to a situation where arriving customers at random points in time, enter a bank, joins the line of customers and wait until a teller is free then turn for one of the two tellers available. This describes the queueing system.

It is therefore important to understand the different elements of a waiting line system. These elements include the customer population source, the service system, the arrival and service patterns, and the queue discipline used for controlling the customer. A queueing system is considered the waiting line or the queue as well as the available service facility that contains one or more servers. The queue is the place where customers spend most of their time. Queueing

systems can have single or multiple lines. In Landbank-La Trinidad, it has a single line of customers. In general, we shall consider the term customer as any entity demanding or requiring service within a queuing system. In this study, a customer is a person waiting in line for the bank teller's service. The term service, as applied to queuing system, will refer to the facility. In the study, it refers to the teller's service. The last component is the server who makes up the service facility.

Objectives of the Study

The study sought to determine the variables that cause the queueing of customers serviced at Landbank-La Trinidad, Benguet. Specifically, the study aimed to:

1) Determine the arrival distribution of customers of Landbank-La Trinidad, Benguet who deposit, withdraw, update/check balances, exchange funds and pay BIR tax

2) Determine the service time distribution of customers of Landbank-La Trinidad, Benguet who deposit, withdraw, update/check balances, exchange funds and pay BIR tax

3) Determine the operating characteristics of queuing of customers at Landbank-La Trinidad, Benguet

4) Determine the economic analysis of the operating characteristics of queuieng of customers at Landbank-La Trinidad, Benguet

Importance of the Study

The study helps in making effective decisions whether or not to make changes, or several alternatives about situation that involves waiting lines. Results will provide information to the management of Landbank-La Trinidad, Benguet, and other business establishment or commercial institution on the proper management of queues and the importance of balance between services to customers, to what level of service to offer. The study is very important to Landbank-La Trinidad, Benguet and other business establishment in their immediate but appropriate solution to prevent the existence of long waiting lines that may cause losses in the business.

The study provides information to the customers on proper understanding on the reasons for queueing.

Scope and Delimitation of the Study

This study was focused on the application of analysis of queueing of the customers serviced at Landbank-La Trinidad, Benguet who deposit, withdraw, update/check of account balance, exchange funds and pay BIR tax.

The variables that were gathered were the arrival time, waiting time and the service time. The gathered data were observed and tallied on December 17-21, 2007 and January 7-11, 2008. The data gathered were observed in two different weeks because December was the peak times while January was the normal operation of the bank.

REVIEW OF LITERATURE

Queueing is a daily encounter. Existence of long queues is undesirable to the customers and also to the management, thus management scientist has formulated a study on queueing.

Studies on Queueing

Wang Zenghua (2007) conducted a study on Local Banks Line up To Tackle Queueing Times in Shanghai China. Results required the domestic banks in the city to devise measure to deal with long queues at their outlets amid growing complains from customers and threats the regulator. Analysts said domestic banks cannot ignore their lower-end customers as they court a higher-end group.

The recent outcry from customers over long waiting times at bank outlets prompted the regulator to urge domestic institutions to find solutions and threaten punishment. Bank of Communications (BoCom) suggested on the "making effective steps" and regards the issue as a priority as it quickens the expansion and optimizes the structure of its customer base. The bank will add more staff during rush hours like lunchtime and peak times when new mutual funds and treasury bond are issued.

Other banks in Shanghai said "they would add more ATMs and self service-machines and guide their customers to use them". Banks also said that

they would add more staff during rush hours like lunchtime and peak times. They would use counters reserved for VIP clients for regular customers when queues are long. BoCom pledge to install water dispensers, newspaper stands and TV sets as its major outlets in a bid to improve the environment.

Furthermore, Zughbur (2005) conducted a study of GAZA Seaport Berthing Facilities Using Simulation. Queuieng model of the logistic activities to the arrival, berthing, and departure of ships in GAZA Seaport in Palestine was presented in the study. Non standard service stations, time dependent priority mechanism, and complex resource allocation policies prevent the use of analytical approach, to the solution. By adopting the process approach, a simulation model for the queuing model has been developed for GAZA Seaport. This requires a limited effort when using graphical objects of the Arena program for discrete – event simulation. Good validations of results against measures on a real system are obtained using aggregated data related to finite time horizon. Steady state simulation results illustrate the use of the model.

Garroppo, Giordano, and Pagano (1998), conducted a study on Stochastic Traffic Features and Queueing Working Conditions: A Simulation Study. The paper presents an extended simulation study aimed to the evaluation of the impact on queueing performance of different statistical features of actual traffic data. In particular, the relevance of marginal distribution (PDF of the arrival rate) and memory properties (LRD-SRD) is considered, highlighting the impact of these

features in different queueing scenarios, varying queue length and loading conditions. The study is carried out by means of discrete event simulation driven by actual traces (collected during measurement sessions) and synthetic sequences generated according to different models. The choice of the generation procedures is motivated by model adequacy in capturing the considered statistical features of actual traffic. The analysis emphasizes the need of a proper methodology (which takes into account working conditions) in model selection for realistic queueing performance evaluation

Banks and Dai (1996) in their study on Simulation Studies of Multiclass Queueing Networks conclude that, researcher have been rather surprised to learn that there are open networks that are unstable even though their traffic intensity at each station is less than unity. This article described some of the network that have exhibited this surprising behavior and further illustrated the instability or conjecture about both stability and instability. In particular, it demonstrated that some buffer priority dispatching rules as well as FIFO, shortest-mean-processing-time-first, and shortest-remaining-processing-time-first dispatching rules can be unstable. Researcher are continuing their investigation in this area, both theoretical and application interest

Norros and Virtamo (2005) made a study on "Importance Sampling Simulation Studies on the Discrete Time n{D}/{D}/1 Queue" they concluded that the importance sampling simulation can be used as an effective tool also in the

analysis of non-Markovian queueing systems. However, the use of the measure transformation is difficult in general.

Al-Deek and Radwan(1995) in their case study on the Operational Benefits of Electronic Toll Collection cited the improvements in traffic operations at the electronic toll collection plazas of the Orlando-Orange Country Expressway Authority. Service time, vehicle arrival times, and departure times, as well as vehicle counts were collected before and after the installation of automatic vehicle identification technology known as E-PASS. The findings indicate that, for the dedicated E-PASS lane, the measured capacity has tripled, the service time has decreased by five seconds per vehicle, the average queueing delay has decreased by one minute per vehicle, the maximum queueing delay has decreased by 2.5-3 minutes per vehicle, and the total delay has decreased by 8.5-9.5 vehicle per morning peak per hour for that lane. Also, variability in the headway has been reduced significantly in the dedicated E-PASS lane. Capacity, headway, and service times of the mixed (manual/E-PASS or automatic/E-PASS) lanes did not change significantly. However, arrivals have shifted to the dedicated E-PASS lanes, thus reducing delays at the mixed lanes and improving traffic operation for the entire toll plaza.

Le Ny (2005) studied a queue with two classes of customers, a single server and FIFO discipline. Class – I (I = 1, 2) customers arrive according to Poisson processes; there is no priority between the two classes. The service of

class-1 costumers is exponential whereas class-2 customers are served instantaneously. We have obtained exact formulas of geometric form for the stationary probability of each ordered state and for the steady-state distributions of customer numbers in the system.

Krinik, Rubino, Marcus, Swift, Kasfy, and Lam (2005) using the concept of duality between stochastic processes as defined in " Continuous-Time Markov Chains" (Anderson, 1991, Springer-Verlag), developed a new approach to obtain closed-form expressions of transient distribution for basic Markovian queues. The idea is to go to discrete time through uniformization, then to use duality to map the problem into transient analysis of absorbing models and then, to use combinatorial techniques to analyze these absorbing chains.

Belen (1988) fitted a stochastic time series model on the monthly recorded rate of crimes. Two models, both adequate for forecasting were derived. The second model which was derived from a logarithmic transformed differenced series is more preferred with respect to some aspect than the first model which was derived from a differenced series.

THEORETICAL FRAMEWORK
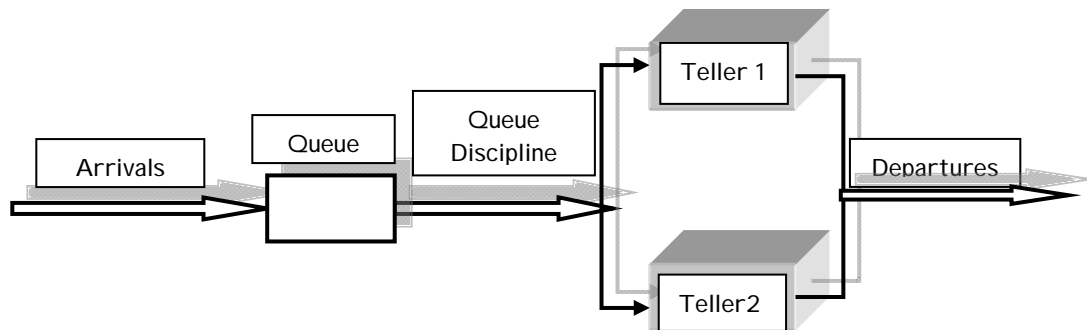
Figure.1 Multiserver Single-Queue Diagram of Landbank-La Trinidad, Benguet

Multiserver Queuing Model

Multiserver single-line model is a logical extension of a single server queueing model. It means that two or more service locations are present. Items arriving for service wait in a single waiting line and they may move to the first available server to be serviced.

For a waiting line problem, queueing model may be used to identify the systems operating characteristics these are the:

1) probability of zero customers in the system at time t

2) probability of n customers in the system when n < k

3) probability of n customers in the system when n ≥ k

4) average waiting time in the queue

5) average waiting time in the system

6) average number of customers in the waiting line

7) average number of customers in the system

In order to develop a waiting line model, we will need to identify some important characteristics of the system:

1) the arrival distribution

2) the service time distribution

3) the queue discipline

Arrival Distribution

Arrival distribution for a waiting line involves determining how many customers arrive and the pattern of arrivals over a given period of time. The arrivals occurring in a given period of time appear to have a random pattern and each arrival is independent of the other arrivals. The probability distribution function which provides a good description of arrival pattern is the Poisson process. One of the most useful applications of the Poisson distribution is in the field of queueing theory. In many situations where queues occur, it has been shown that the number of people joining the queue in a given time period follows the Poisson model.

The Poisson probability distribution is defined as:

$$P(x) = \frac{\lambda e^{-\lambda}}{x!} \quad \text{for x = 0, 1, 2...........} \tag{1}$$

Where in waiting line application:

x = number of arrivals in a specified period of time

λ = average number of arrivals for the specific period of time

e = 2.71828

Service Time Probability

A service time probability distribution describes how long it takes a customer to acquire the service needed. Since the customer demand a different service, the teller's service times will vary. Thus, the service process will follow an exponential probability distribution.

The exponential probability distribution is defined as:

$$F(x) = 1 - e^{-(\mu t)} \qquad \text{for } x \geq 0 \qquad (2)$$

Where:

x = service time

μ = average number of units that the service facility can handle in a specific period of time

e = 2.71828

Queue Discipline

Queue discipline is a manner in which the waiting customers are ordered for service. In Landbank-La Trinidad, the waiting customers are ordered on a first come first serve basis which is referred to us a first–in–first–out (FIFO) queue discipline.

Multiserver Single-Line Queueing Model

The model assumes that there are k identical servers, the service time distribution for each k server is exponential and the arrival distribution can be described by the Poisson distribution and that the queue discipline is a first in first out basis.

Utilization Rate

This shows the percentage of time, the servers are busy or the probability that the servers are busy. The utilization rate is defined as:

$$\rho = \frac{\lambda}{k\mu} \qquad \text{for } k\mu > \lambda \qquad\qquad (3)$$

Where:

λ = average number of arrivals for the specific period of time

μ = average number of units that the service facility can handle in a specific period of time

k = number of servers

Using these assumptions the operating characteristics can be described with the following formulas: Let

λ = average arrival rate of the costumers

μ = average service rate of the k identical servers in the facility

k = number of available servers $(1 < k < \infty)$

1) the probability that the k service channels are idle (zero customers in the system at time t):

$$p_0(t) = \frac{1}{\left[\sum_{n=0}^{k-1} \frac{1}{n!}\left(\frac{\lambda}{\mu}\right)^n\right] + \frac{1}{k!}\left(\frac{\lambda}{\mu}\right)^k \frac{k\mu}{(k\mu - \lambda)}} \quad \text{for } k\mu > \lambda \qquad (4)$$

2) the probability of n customers in the system:

$$p_n(t) = \frac{1}{k!k^{n-k}}\left(\frac{\lambda}{\mu}\right)^n p_0(t) \quad \text{for } n > k \qquad (5)$$

$$p_n(t) = \frac{1}{n!}\left(\frac{\lambda}{\mu}\right)^n p_0(t) \quad \text{for } n \leq k$$

3) the average number of customers in the service system:

$$L = \frac{\lambda\mu\left(\frac{\lambda}{\mu}\right)^k}{(k-1)!(k\mu - \lambda)^2}P_0(t) + \frac{\lambda}{\mu} \qquad (6)$$

4) the average time a customer spends in the system (waiting time + service time):

$$W = \frac{\lambda\mu\left(\frac{\lambda}{\mu}\right)^k}{(k-1)!(k\mu - \lambda)^2}P_0(t) + \frac{1}{\lambda} \qquad (7)$$

$$= \frac{L}{\lambda}$$

5) The average number of customers in the queue waiting for service:

$$L_q = L - \frac{\lambda}{\mu} \qquad (8)$$

6) The average time a customer spends in the queue waiting for the service:

$$W_q = W - \frac{1}{\mu}$$

$$= \frac{L_q}{\lambda} \qquad\qquad (9)$$

7) The probability that an arriving unit has to wait for service:

$$P_w = \frac{1}{k!}\left(\frac{\lambda}{\mu}\right)^k \left[\frac{k\mu}{(k\mu - \lambda)}\right] P_0(t) \qquad\qquad (10)$$

<u>Definition of Terms</u>

<u>Arrival Distribution</u> involves determining how many units arrive and the pattern of arrivals over a given period of time.

<u>Arrival rate</u> is the average number of customers arriving per time period denoted by lambda (λ).

<u>Bank</u> is a business which provides financial services for profit.

<u>Customer</u> is any entity demanding or requiring service.

<u>Exponential Distribution</u> is a particular function form for a continuous distribution with parameter k, a scalar real greater than zero. They are often used to model the time between independent events that happen at a constant average rate.

Poisson distribution is a distribution that arises when you count a number of events across time or over an area. The Poisson distribution involves counting of events.

Queue means a waiting line, it represents a certain number of certain number of customers waiting for service (of course the queue may be empty).

Queue Area is a place in which people in line wait for goods or services.

Queue Discipline represents the way the queue is organized (rules of inserting and removing customers to/from the queue).

Queueing refers to waiting.

Queueing Theory is a mathematical study of waiting lines (or queues). It is concerned in the factors relating to queues such as the distribution of arrivals, the average time spent in the queues.

Server is the facility that provides service.

Service rate is the average number of customers that can be served per time period denoted by mu (μ).

Service Time Distribution describes how long it takes a customer acquire the service needed.

Utilization rate shows the probability that the server is busy, denoted by rho (ρ).

METHODOLOGY

Respondents of the Study

The respondents of the study were the customers of Landbank La Trinidad, Benguet who deposit, withdraw, update account balances, exchange funds and pay BIR tax. There were 3116 customers who composed the respondents of the study. Due to confidential reasons, we were not able to get the number of customers who deposit, withdraw, update account balances, exchange funds and those who paid BIR tax.

Data Used

The data gathered were the arrival time, waiting time and the service time. The arrival time was timed and tallied upon the entry of a customer to the bank, waiting time was timed and tallied when customer joins the waiting line and the service time was gathered and timed once the customer was there at the teller window of the bank.

Statistical Analysis

The data gathered were encoded and summarized and were analyzed using Microsoft Excel. Average number of customers arriving per hour (λ) and the average number of customers that can be served per hour (μ) were computed using the Microsoft excel.

Poisson distribution was used in the description of the customer arrival rate and Exponential distribution was used in the description of the customer service rate. The queue discipline is a first-in-first-out basis (FIFO). Using these assumptions, the operating characteristics of waiting line system were computed. These were the probability that the service facilities are idle, probability of specific number of customers in the system, the probability that an arriving customer has to wait for service, the average number of customers in the system, the average time each customer spends in the system, the average number of customers in the queue waiting for the service and the average time each customer spends in the queue waiting for the service.
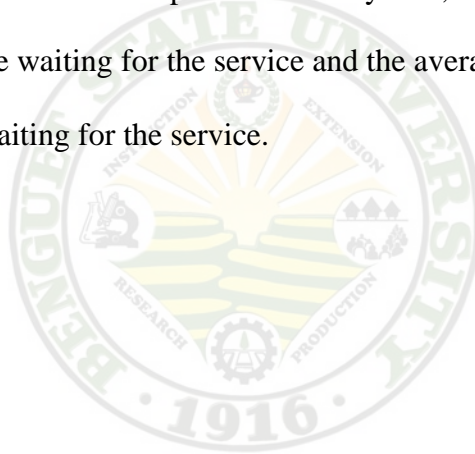
RESULTS AND DISCUSSION

The Arrival Distribution of Customers Serviced
at Landbank-La Trinidad, Benguet

Table 1 presents the summary for the arrivals of customers per hour interval, the mean of the arrivals, the total number of arrivals and the over-all mean.

The time interval between 8:30-9:30 had the highest customer arrival with 945. It had also the highest mean of 47 customers arrival per hour. This time interval had the highest arrival because of the BIR tax payers. Since paying of BIR tax was scheduled 8:30-12:00, most of the customers arrive in this time interval. Where, time interval 2:31-3:00 had the lowest number of arrivals with 224 and had the lowest mean of 12. This is because the time interval that was considered was 30 minutes or 0.5 hours which is the closing time for the bank.

Table 1. Summary of arrivals and arrival means

HOUR INTERVAL	# OF CUSTOMER	MEAN ARRIVAL/HOUR
8:30-9:30	945	47
9:31-10:30	514	26
10:3-11:30	391	20
11:31-12:30	337	17
12:31-1:30	314	16
1:31-2:30	371	19
2:31-3:00	224	12
Over-all mean		22

The Arrival Distributions at Landbank-La Trinidad, Benguet

In Landbank-La Trinidad, customer arrivals were not scheduled and occurred in an unpredictable manner, a random pattern appeared to exist. Thus, to determine the customer arrivals at Landbank-La Trinidad, the Poisson distribution provides a good description of the arrival pattern. The Poisson probability distribution is defined as: $P(X \le x) = \dfrac{\lambda^x e^{-\lambda}}{x!}$ for x = 0, 1, 2,…….. where from Table 1 the mean customers arrival per hour is $\lambda = 22$ and e = 2.71828.

Table 2 presents the Poisson customers arrival distribution of Landbank-La Trinidad, Benguet, where we would expect 5 arrivals at 0.0012% of the time, 10 arrivals at 0.31%, 15 arrivals at 6.97% of the time or 4.18 minutes, 20 arrivals at 36.64% of the time or 21.98 minutes, 25 arrivals at 76% of the time or 45.6 minutes, 30 arrivals at 95.42% of the arrivals or 57.25 minutes, 35 arrivals at 99.73% of the time or 59.73 minutes, 40 arrivals at 99.98% of the time or 59.99 minutes,45 arrivals at 99.99% of the time or 59.99 minutes and 50 arrivals at 100% of the time or exactly one hour.

Figure 2 presents the graph for the Poisson arrival distribution of customers serviced at Landbank-La Trinidad, Benguet. It shows that as the number of arrivals increases, the probability of having arrivals in an hour also increases. This implies a positive relationship between the numbers of arrivals in an hour and the probability that the arrival is expected in an hour of the time.

Table 2. Arrival distributions

NUMBER OF ARRIVALS	P(X ≤ x)
5	0.0000
10	0.0031
15	0.0697
20	0.3664
25	0.7600
30	0.9542
35	0.9955
40	0.9998
45	1.0000
50	1.0000
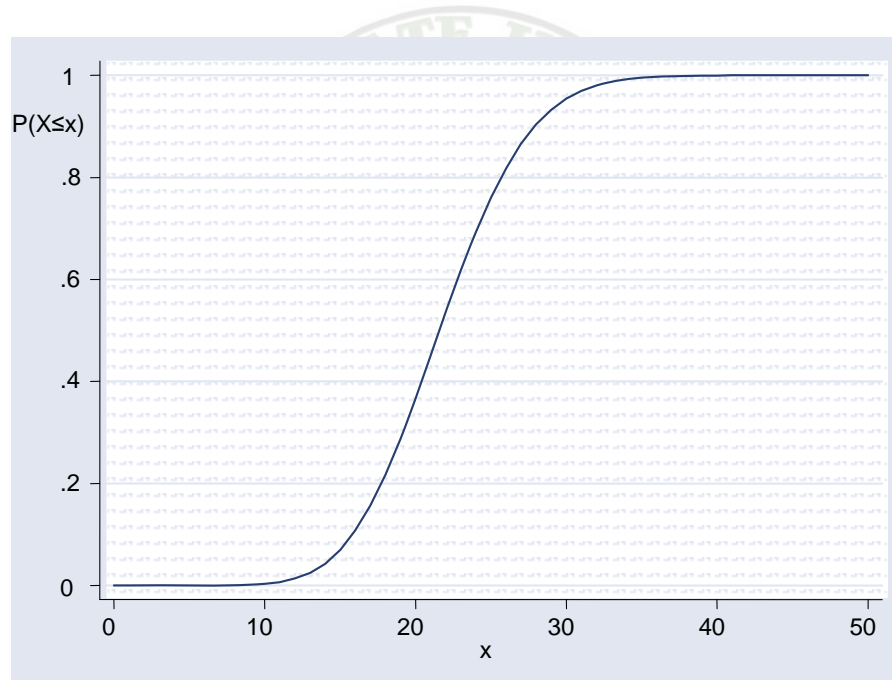
Figure 2. Graph of the Poisson arrivals of customers serviced at Landbank-La
Trinidad (Cumulative Density Function)

The Service Time of Customers Serviced
at Landbank-La Trinidad Benguet

Table 3 presents the summary for the number of customers serviced by the teller of Landbank-La Trinidad who had either deposit, withdraw, update account balances, exchange funds or pay BIR tax per one hour interval, the mean of the customers serviced by the teller, the total number of customers who were serviced and the over-all mean of the customers being served by the bank teller per day.

From Table 3 the time interval between 8:30-9:30 had the highest customer serviced by the teller 1 and teller 2 with 18 and 13 customers serviced per hour. It had also the highest over all total of 31 customers serviced per hour by the two tellers. The over all mean of customers serviced per hour by the teller is 14. This implies that from Table 1 the average number of arrivals per hour was 22 and from Table 3 the average number of customers that was served by the bank teller per hour was 14. Thus, there was discrepancy between the arrivals of customers per hour and the customer serviced by the bank teller per hour. This is the reason for queueing. The time interval between 2:31-3:00 had the lowest number of customers serviced by the Landbank-La Trinidad teller with 8 customers serviced per hour. This is because the time interval that was counted was 30 minutes or 0.5 hours.

Table 3. Summary of customers serviced per hour and service mean

HOUR INTERVAL	TELLER 1	TELLER 2	SERVICED/HOUR
8:30-9:30	18	13	31
9:31-10:30	8	9	17
10:3-11:30	7	6	13
11:31-12:30	5	5	10
12:31-1:30	5	4	9
1:31-2:30	7	6	13
2:31-3:00	4	4	8
Over-all mean			14

Customers of Landbank-La Trinidad demanded different services. They deposit, withdraw, update accounts, exchange funds, and pay BIR tax, thus the teller's service times varied. The exponential probability distribution was used to describe the service time. The exponential probability distribution is defined by $f(x) = \mu e^{-\mu t}$ for x ≥ 0 where μ = 14 and e = 2.71828. Table 4 presents the exponential distribution for the service time thus, we would expect 75.34% of the 22 customers who arrived to be serviced in 6 minutes (t = 0.1), 93.92% of the customers to be serviced at 12 minutes (t = 0.2), 98.50% of the customers to be serviced at 18 minutes (t = 0.3), 99.63% of the customers to be serviced at 24 minutes (t = 0.4), 99.91% of the customers to be serviced at 32 minutes (t = 0.5), 99.98% of the customers to be serviced at 36 minutes (t = 0.6), 99.99% of the customers to be serviced at 42 minutes (t = 0.7), 100% of the customers to be serviced at 48 minutes (t = 0.8), 100% of the customers to be serviced at 54 minutes (t = 0.9), 100% of the customers to be serviced at 60 minutes (t = 1.0).

Figure 3 presents the graph for exponential of the service time of
Landbank-La Trinidad. As the value of the service time increases, the probability
of the customers being serviced also increases. Thus, it implies a positive
relationship between the service time and the probability of customers being
serviced.

Table 4. Service time distribution of assumed values of service time (in hours)

SERVICE TIME (IN HOURS)	P (st ≤ x)
0.1	0.7534
0.2	0.9392
0.3	0.9850
0.4	0.9963
0.5	0.9991
0.6	0.9998
0.7	0.9999
0.8	1.0000
0.9	1.0000
1.0	1.0000
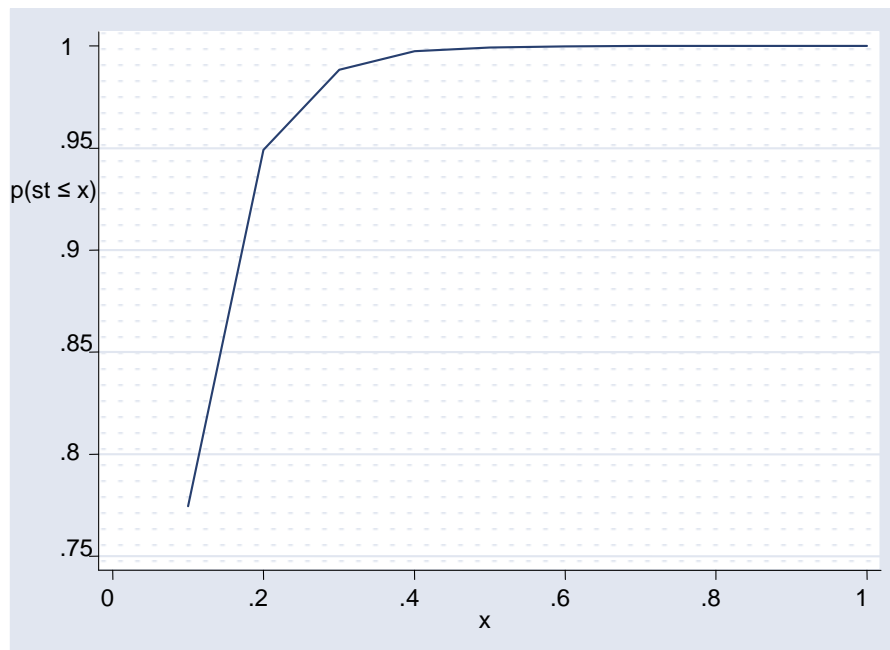
Figure 3. Graph of the exponential service time of customers serviced at
Landbank-La Trinidad (Cumulative Density Function)

Operating Characteristics of Customers Serviced
at Landbank-La Trinidad, Benguet

Using the Poisson arrivals and exponential service times with identical
servers and a first in first out queue discipline, operating characteristics for the
multiserver single queue was presented in Table 5.

Table 5 presents the teller utilization rate which is the percentage of the
time a teller is busy. The total service rate must be greater than the arrival rate that
is $k\mu > \lambda$. If $k\mu \le \lambda$ the average number of customers in the system (L) and the
average time a customer spends in the system (W) both become infinitely large. In
Table 5, the utilization rate is clear, that the formula is applicable since the $\dfrac{\lambda}{k\mu} < 1$,

thus the probability that the servers were busy is 79%. The probability that the teller was idle is 12% which imply that the servers were free for 7.2 minutes upon the start of the operation, thus most of the time the teller is busy. On the average, there are 5 customers in the system. The average time a customer spends in the system was 0.21 hour or 13 minutes. The average time a customer spends in the queue before being served is 0.14 hours or 8 minutes. The average number of customers in the waiting line was 3 and that 69% of the arriving customers had to wait for the service.

Suppose we add another teller using the same arrival rate and service rate, three identical servers and a first-in first-out queue discipline. Based on Table 5 the probability that the servers are busy is reduced from 79% to 52%. The probability that the teller is idle increased from 12% (7.2 minutes) to 19% (11.4 minutes) which implies that teller is free at least 10.3 minutes. The average number of customers in the system is reduced form 5 to 2. The average time a customer spends in the system is reduced from 0.21 hours (13 minutes) to 0.08 hours (5 minutes). The average number of customers in the queue are reduced from 3 to 0.27 and that the probability that arriving customers has to wait is reduced from 69% to 26%. The result implies that an arriving customer will be served directly or wait at least a minute or less.

The advantages are clear. The three-teller will greatly improve the operating characteristics of the system.

Table 5. Economic analysis on the operating characteristics of the queuieng of
customers serviced at Landbank-La Trinidad, Benguet

Servers (k)	ρ=λ/kμ	P(0)	L	W	Lq	Wq	Pw
2	0.79	0.12	5	0.21	3	0.14	0.69
3	0.52	0.19	2	0.08	0.27	0.01	0.26

Legend:
ρ = probability that the teller is busy (utilization rate)
P(0) = probability that the teller is idle
L = average number of units in the system
W = the average time a unit spends in the system (waiting time + service)
Lq = the average number of units in the queue waiting for the service
Wq = the average time a unit spends in the queue waiting for service
Pw = the probability that an arriving customer has to wait for service
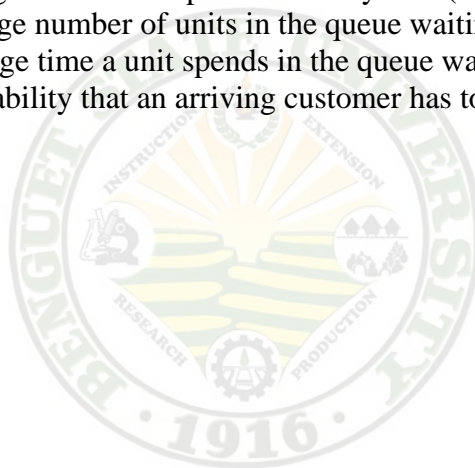
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The study was conducted to determine the arrival distribution, the service time distribution, the operating characteristics and the economic analysis of customers serviced at Landbank-La Trinidad, Benguet. The respondents of the study were the customers of Landbank-La Trinidad, Benguet who deposit, withdraw, and update account balances, exchange funds and pay BIR tax. There were 3116 customers who composed the respondents of the study.

The average number of customers who arrived at Landbank-La Trinidad, Benguet were 22 customers/hour and the average customer that the teller can serviced per hour were 14 customers, thus the discrepancy between the customers arrivals and the number of customers serviced by the teller results to long queues of customers.

In Landbank-La Trinidad customer arrivals were not scheduled and occurred in an unpredictable manner, a random pattern appeared to exist. Thus to determine the customer arrivals at Landbank-La Trinidad, the Poisson distribution provides a good description of the arrival pattern. The Poisson probability distribution is defined as: $P(X \leq x) = \dfrac{\lambda^x e^{-\lambda}}{x!}$ for x = 0, 1, 2,…….. where $\lambda = 22$ and e = 2.71828.

Customers of Landbank-La Trinidad demand different services. They either deposit, withdraw, update accounts, exchange funds, pay BIR tax hence, the teller's service times vary. The exponential probability distribution was used to describe the service time. The exponential probability distribution is defined by $f(x) = \mu e^{-\mu t}$ for x ≥ 0 where μ = 14 and e = 2.71828.

Using the assumptions of Poisson arrival and exponential service time, a first-come-first-served queue discipline and two identical servers, the operating characteristics were computed. On the average, there were 5 customers in the system (L); the average time a customer spends in the system is 13 minutes (W), on the average, there were 3 customers in the queue waiting for the service (Lq), the average time a unit spends in the queue waiting for service is 8 minutes (Wq) and the probability that an arriving customer has to wait for service is 69% (Pw).

Adding another teller using the same arrival rate and service rate, three identical servers and a first-in first-out queue discipline, On the average, the number customers in the system was reduced from 5 to 2 (L); the average time a customer spends in the system was reduced from 13 minutes to 5 minutes (W), on the average 3 customers in the queue waiting for the service was reduced from 0.27 (Lq), the average time a unit spends in the queue waiting for service was reduced from 8 minutes to 0.6 minutes (Wq) and the probability that an arriving customer had to wait for service was reduced from 69% to 26% (Pw).

The advantages are clear. The three-teller system greatly improves the operating characteristics of the system.

Conclusions

The arrival rate and service rate are the most important variables to be considered in the analysis of queueing. It is the variability in arrival and service patterns that causes the long queues of customers in the bank. They are used in queueing formulas to compute the operating characteristics.

Based on the results of the operating characteristics of Landbank-La Trinidad, Benguet, this indicates that customer wait an average of 0.21 hours or 13 minutes before being served. This appears to be undesirable. The fact that on the average, there are 5 customers waiting in the line and that 69% of the arriving customers have to wait for service are indicators that something should be done to improve the efficiency of the bank teller of Landbank-La Trinidad.

Adding another teller improves the operating characteristics of the system; based on the results of the operating characteristics, the advantages are clear that a customer wait an average of 0.01 hours or 0.60 minutes. On the average, there are 2 customers waiting in line and that 26% of the arriving customer has to wait for the service. Results of adding another teller greatly improves the operating characteristics of the system.

<u>Recommendations</u>

The results on the queuing analysis of customers serviced at Landbank-La Trinidad may be utilized by the bank management and serve as basis on the need to change the system to alter its performance. Since customer often link long waits to poor quality service, types of changes can be made to the different elements of waiting line system. In the arrival distribution of the customers at Landbank-La Trinidad could be altered like running special promotions during the non-peak times.

For the convenience of the customers in the queue, bank management can improve its environment by installing water dispensers and news paper stands. For service efficiency, the management could add more staff during peak times. They may use especial counters for regular VIP clients and senior citizens. The queue discipline or the priority rule can be altered like customers requiring short service times will be the first to be serviced but the management must consider the impact on those customers who will wait longer.

Lastly, management must consider the goal of having enough servers to assure that waiting is within allowable limits. However cost effectiveness must be considered before additional servers are hired.

LITERATURE CITED

BANKS, J. and J.G. DAI. 1996. Simulation Studies of Multiclass Queueing Networks. New York.

BOROVKOV, A.A.1980. Asymptotic Methods in Queueing Theory.

CHANG, W. 1970. "Single Server Queueing Processes in Computing Systems". IBM Systems Journal. New York: Wiley.

COHEN, J. W. 1989. Single Server Queue. North Holland, Amsterdam, New York.

COX, D.R. and W. L. SMITH. 1963. Queues. New York: Wiley.

COOPER, R.B. 1981. Introduction to Queueing Theory. North Holland, New York.

GARROPPO, R.G, GIORDANO, and S. M. PAGANO. 1998. Stochastic Traffic Features and Queueing Working Conditions: A Simulation Study.

GROSS, and HARRIS.1998. Fundamentals of Queueing Theory.

KALASHNIKOV, V. V.1995. Mathematical Methods in Queueing Theory.

KENDALL, D. G. 1951. "Problems in the Theory of Queues". Journal of the Royal Statistical Society, Series B 13:151-85.

KLEINROCK, LEONARD. 1975. Queueing Systems Theory, Volume 1. New York: Wiley.

KRINIK A., G. RUBINO, D. MARCUS, R. SWIFT, H. KASFY, and H. LAM. 2005. "Dual Processes to Solve Single Server Systems". Journal of Statistical Planning and Inference Vol. 135.

LE NY L. M. 2005. Geometric Form Solution for a Two Class FIFO Queue with Instantaneous Service for One Class. In Proceedings of the European Simulation and Modeling Conference, Porto, Portugal

MOOD, A. M., F. A. GRAYBILL, and D. C. BOES.1993. Introduction to the Theory of Statistics - 3rd Edition. McGraw-Hill,Milano.

NORROS, I. and VIRTAMO, J.2005. Importance Sampling Simulation Studies on the Discrete Time N{D}/{D}/1 Queue. Finland.

PRAHBU, N. U.1965. Queues and Inventories. New York: Wiley.

SIGMAN. K. 2001. Queueing Course. Lecture Notes. Columbia University, New York.

TANNER, M. 1995. Practical Queueing Analysis. New York, McGrow Hill.

APPENDIX A

Benguet State University
College of Arts and Sciences
MATH-PHYSICS-STATISTICS DEPARTMENT

December 11, 2007

Ms. Adeline M. Ramos
Manager
Landbank of the Philippines-La Trinidad
Benguet Branch

Ma'am:

Greetings!

The undersigned are conducting a thesis entitled "Analysis of Queueing of Customers Serviced at Landbank La Trinidad, Benguet". This is a partial requirement in the degree Bachelor of Science in Applied Statistics.

In this connection, we would like to ask your permission to gather the necessary data from your office, which includes the arrival time, service time and the number of customers waiting at the teller windows from December 17-21, 2007 and January 7-11, 2008.

Your kind approval on this matter is highly appreciated. Rest assured that the data gathered would be held confidential.

Thank you and more power.

Respectfully yours,

Melanie B. Menzi
Rhea B. Ngoaban

Noted By:

Ms. Marycel H. Toyhacao
        Adviser

Maria Azucena B. Lubrica Ph. D
 Chairman, MPS-Department

College of Arts and Sciences
MATH-PHYSICS-STATISTICS DEPARTMENT

APPLICATION FOR ORAL DEFENSE

Date: March 17, 2008

Group Members:
     Melanie B. Menzi   Major Field: Statistics
     Rhea B. Ngoaban   Minor Field: Information Technology

Degree: Bachelor of Science in Applied Statistics

Title of Thesis: ANALYSIS OF QUEUEING OF CUSTOMERS SERVICED AT LANDBANK-LA TRINIDAD, BENGUET.

Endorsed: Marycel H. Toyhacao
Adviser

Date and Time of Defense: March 17, 2008 @ 4:00 pm
Place of Defense: CAS-An 210

Noted:
Maria Azucena B. Lubrica, Ph D.
Department Chairman

REPORT OF RESULT OF MANUSCRIPT/PROJECT DEFENSE
Name and Signature   Remarks*

Marycel H. Toyhacao
     Adviser

Salvacion Z. Beligan
     Member

Maria Azucena B. Lubrica
     Member

Cristina B. Ocden
     Member

*Passed/failed

Appendix C. Raw Data

C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6
1	1	1	8:30	300	170	1	9	54	9:21	6442	624
1	1	2	8:30	430	50	1	9	55	9:21	6592	90
1	1	3	8:30	500	46	1	9	56	9:21	6720	172
1	1	4	8:30	574	51	1	9	57	9:24	7203	117
1	1	5	8:30	643	53	1	9	58	9:27	6636	147
1	1	6	8:30	710	115	1	9	59	9:27	6760	74
1	1	7	8:30	835	68	1	9	60	9:30	6034	77
1	1	8	8:30	887	362	1	9	61	9:32	6557	72
1	1	9	8:32	1185	62	1	9	62	9:36	6365	338
1	1	10	8:32	1123	62	1	9	63	9:37	7047	136
1	1	11	8:32	1181	64	1	9	64	9:39	6671	71
1	1	12	8:32	1237	67	1	9	65	9:44	6480	111
1	1	13	8:32	1290	57	1	9	66	9:45	6489	153
1	1	14	8:34	1233	93	1	9	67	9:46	6636	119
1	1	15	8:34	1320	74	1	9	68	9:46	6757	57
1	1	16	8:34	1426	65	1	9	69	9:51	6520	318
1	1	17	8:36	1361	655	1	9	70	9:55	6562	33
1	1	18	8:36	1620	66	1	9	71	10:09	6289	341
1	1	19	8:37	1669	130	1	9	72	10:14	5768	60
1	1	20	8:37	1779	72	1	9	73	10:22	5348	153
1	1	21	8:40	1647	31	1	9	74	10:22	5555	206
1	1	22	8:42	1088	58	1	9	75	10:24	5589	236
1	1	23	8:42	1620	51	1	9	76	10:34	5233	154
1	1	24	8:44	1509	58	1	9	77	10:38	5199	200
1	1	25	8:44	1571	64	1	9	78	10:38	5359	128
1	1	26	8:46	1507	48	1	9	79	10:49	4811	165
1	1	27	8:46	1579	114	1	9	80	10:51	4866	51
1	1	28	8:47	2280	52	1	9	81	10:55	4695	219
1	1	29	8:49	1593	62	1	9	82	10:56	4896	86
1	1	30	9:00	931	36	1	9	83	11:01	4630	97
1	1	31	9:01	960	55	1	9	84	11:12	4113	428
1	1	32	9:02	960	57	1	9	85	11:13	4467	142
1	1	33	9:04	843	75	1	9	86	11:17	4323	138
1	1	34	9:09	708	137	1	9	87	11:18	4485	136
1	1	35	9:09	811	108	1	9	88	11:24	4229	170
1	1	36	9:10	943	74	1	9	89	11:36	3699	74
1	1	37	9:11	929	55	1	9	90	11:46	3145	306

1	1	37	9:11	929	55	1	9	90	11:46	3145	306
1	1	38	9:12	934	61	1	9	91	11:56	2849	73
1	1	39	9:15	900	79	1	9	92	12:00	2646	54
1	1	40	9:15	1001	62	1	9	93	12:43	132	53
1	1	41	9:18	960	75	1	9	94	12:43	199	51
1	1	42	9:18	1055	51	1	9	95	12:45	148	79
1	1	43	9:21	944	63	1	9	96	12:59	0	117
1	1	44	9:21	1001	248	1	9	97	1:02	0	218
1	1	45	9:23	1113	56	1	9	98	1:04	0	162
1	1	46	9:23	1177	83	1	9	99	1:05	120	178
1	1	47	9:24	1154	182	1	9	100	1:07	360	85
1	1	48	9:24	1392	48	1	9	101	1:09	335	61
1	1	49	9:26	1344	75	1	9	102	1:13	174	45
1	1	50	9:27	1869	42	1	9	103	1:13	229	103
1	1	51	9:28	1887	56	1	9	104	1:15	120	189
1	1	52	9:32	1951	56	1	9	105	1:16	240	149
1	1	53	9:33	1715	51	1	9	106	1:22	91	151
1	1	54	9:34	1724	65	1	9	107	1:24	60	60
1	1	55	9:34	1839	159	1	9	108	1:29	0	150
1	1	56	9:36	1860	130	1	9	109	2:08	560	42
1	1	57	9:37	1970	64	1	9	110	2:09	578	127
1	1	58	9:37	2026	242	1	9	111	2:11	91	109
1	1	59	9:40	2084	72	1	9	112	2:12	600	30
1	1	60	9:41	2072	66	1	9	113	2:14	492	192
1	1	61	9:44	1946	67	1	9	114	2:15	540	81
1	1	62	9:44	1999	37	1	9	115	2:16	579	59
1	1	63	9:48	1842	144	1	9	116	2:19	460	117
1	1	64	9:49	1878	48	1	9	117	2:22	427	69
1	1	65	9:52	1770	42	1	9	118	2:29	629	89
1	1	66	9:52	1800	275	1	9	119	2:36	1200	41
1	1	67	9:55	1813	86	1	9	120	2:42	1200	60
1	1	68	9:55	1967	50	1	9	121	2:44	1200	41
1	1	69	10:05	1380	53	1	9	122	2:56	499	139
1	1	70	10:05	1864	44	1	9	123	3:02	600	88
1	1	71	10:06	1400	51	1	9	124	3:12	92	212
1	1	72	10:06	1469	42	1	10	1	8:30	360	108
1	1	73	10:17	1007	71	1	10	2	8:30	432	174
1	1	74	10:18	996	207	1	10	3	8:30	618	68
1	1	75	10:20	1029	47	1	10	4	8:30	670	185
1	1	76	10:23	922	40	1	10	5	8:30	845	209
1	1	77	10:26	822	67	1	10	6	8:30	1116	202
1	1	78	10:28	755	84	1	10	7	8:30	1274	186

1	1	79	10:29	731	50	1	10	8	8:30	1448	105
1	1	80	10:31	681	159	1	10	9	8:30	1583	323
1	1	81	10:31	863	66	1	10	10	8:30	1920	174
1	1	82	10:33	797	31	1	10	11	8:30	2046	43
1	1	83	10:33	840	67	1	10	12	8:30	2123	263
1	1	84	10:35	780	50	1	10	13	8:36	2040	129
1	1	85	10:40	483	44	1	10	14	8:40	1940	51
1	1	86	10:44	319	30	1	10	15	8:47	1560	60
1	1	87	10:44	409	87	1	10	16	8:53	1320	146
1	1	88	10:44	442	70	1	10	17	8:57	1294	173
1	1	89	10:44	432	34	1	10	18	9:04	1020	41
1	1	90	10:44	518	38	1	10	19	9:04	1080	79
1	1	91	10:46	420	42	1	10	20	9:09	881	57
1	1	92	10:46	396	63	1	10	21	9:12	764	236
1	1	93	10:46	495	20	1	10	22	9:12	1008	248
1	1	94	10:46	540	169	1	10	23	9:13	1060	145
1	1	95	10:50	486	106	1	10	24	9:19	795	135
1	1	96	10:50	620	34	1	10	25	9:19	960	95
1	1	97	10:50	706	160	1	10	26	9:21	925	85
1	1	98	10:55	486	55	1	10	27	9:21	1020	216
1	1	99	10:55	611	162	1	10	28	9:35	444	182
1	1	100	10:58	749	58	1	10	29	9:37	502	53
1	1	101	10:58	780	31	1	10	30	9:39	449	40
1	1	102	10:58	840	110	1	10	31	9:39	469	215
1	1	103	11:00	785	20	1	10	32	9:40	614	103
1	1	104	11:00	240	46	1	10	33	9:40	631	211
1	1	105	11:00	233	53	1	10	34	9:42	720	224
1	1	106	11:05	622	65	1	10	35	9:45	796	285
1	1	107	11:06	617	51	1	10	36	9:48	927	59
1	1	108	11:10	446	98	1	10	37	9:49	868	37
1	1	109	11:10	588	85	1	10	38	9:51	831	111
1	1	110	11:15	323	83	1	10	39	9:53	600	115
1	1	111	11:15	480	60	1	10	40	9:58	605	108
1	1	112	11:16	960	105	1	10	41	9:59	677	159
1	1	113	11:20	795	36	1	10	42	10:00	878	75
1	1	114	11:20	879	81	1	10	43	10:00	863	107
1	1	115	11:20	918	92	1	10	44	10:01	936	96
1	1	116	11:22	946	46	1	10	45	10:02	1029	93
1	1	117	11:25	720	108	1	10	46	10:04	1056	78
1	1	118	11:28	1130	146	1	10	47	10:06	858	119
1	1	119	11:30	672	36	1	10	48	10:10	799	191
1	1	120	11:32	636	83	1	10	49	10:13	968	89

1	1	121	11:34	553	53	1	10	50	10:14	1059	51
1	1	122	11:34	620	55	1	10	51	10:14	1128	104
1	1	123	11:34	685	52	1	10	52	10:16	1024	64
1	1	124	11:34	753	51	1	10	53	10:18	1020	120
1	1	125	11:36	702	47	1	10	54	10:21	987	83
1	1	126	11:38	600	50	1	10	55	10:22	964	44
1	1	127	11:40	485	74	1	10	56	10:25	860	65
1	1	128	11:40	651	67	1	10	57	10:29	675	296
1	1	129	11:42	584	65	1	10	58	10:32	799	118
1	1	130	11:45	459	49	1	10	59	10:35	741	582
1	1	131	11:47	410	79	1	10	60	10:36	1299	72
1	1	132	11:50	271	63	1	10	61	10:39	1167	319
1	1	133	11:50	328	51	1	10	62	10:42	1268	55
1	1	134	11:50	397	54	1	10	63	10:42	1325	223
1	1	135	11:52	343	137	1	10	64	10:49	1151	107
1	1	136	11:55	266	111	1	10	65	10:53	1044	204
1	1	137	11:57	275	47	1	10	66	10:53	1260	174
1	1	138	11:57	348	304	1	10	67	10:56	1206	59
1	1	139	12:00	464	68	1	10	68	10:56	1267	169
1	1	140	12:04	276	73	1	10	69	10:58	1338	88
1	1	141	12:05	263	51	1	10	70	11:00	1350	422
1	1	142	12:07	212	73	1	10	71	11:06	1408	305
1	1	143	12:07	259	51	1	10	72	11:12	1343	65
1	1	144	12:10	148	237	1	10	73	11:13	1338	898
1	1	145	12:10	391	123	1	10	74	11:14	2180	161
1	1	146	12:53	914	74	1	10	75	11:18	2139	250
1	1	147	12:54	1041	57	1	10	76	11:19	2309	62
1	1	148	1:01	684	45	1	10	77	11:22	2182	362
1	1	149	1:02	699	80	1	10	78	11:27	2540	380
1	1	150	1:05	578	190	1	10	79	11:34	2601	141
1	1	151	1:07	609	174	1	10	80	12:22	0	60
1	1	152	1:10	675	106	1	10	81	12:24	60	89
1	1	153	1:11	749	58	1	10	82	12:31	0	71
1	1	154	1:13	751	169	1	10	83	12:38	0	203
1	1	155	1:13	942	74	1	10	84	12:40	281	47
1	1	156	1:13	988	188	1	10	85	12:40	334	67
1	1	157	1:16	980	169	1	10	86	12:45	97	171
1	1	158	1:20	931	31	1	10	87	12:46	226	64
1	1	159	1:23	721	42	1	10	88	12:54	0	136
1	1	160	1:26	619	117	1	10	89	12:55	104	84
1	1	161	1:26	742	40	1	10	90	12:56	80	55
1	1	162	1:26	822	122	1	10	91	12:56	145	56

1	1	163	1:26	940	125	1	10	92	12:57	149	34
1	1	164	1:26	1055	127	1	10	93	1:00	0	58
1	1	165	1:27	1108	78	1	10	94	1:01	0	57
1	1	166	1:29	1030	61	1	10	95	1:01	60	136
1	1	167	1:29	1089	98	1	10	96	1:02	164	44
1	1	168	1:29	1231	71	1	10	97	1:03	120	170
1	1	169	1:30	1220	65	1	10	98	1:04	190	322
1	1	170	1:30	1275	178	1	10	99	1:05	528	63
1	1	171	1:31	1397	53	1	10	100	1:08	465	285
1	1	172	1:32	1404	404	1	10	101	1:20	0	141
1	1	173	1:32	1840	44	1	10	102	1:20	159	159
1	1	174	1:33	1803	50	1	10	103	1:20	300	270
1	1	175	1:33	1806	101	1	10	104	1:42	696	96
1	1	176	1:50	925	111	1	10	105	1:43	780	46
1	1	177	1:50	1054	63	1	10	106	1:46	614	125
1	1	178	1:51	1051	126	1	10	107	1:52	369	230
1	1	179	1:52	1105	470	1	10	108	1:59	199	79
1	1	180	1:54	1475	121	1	10	109	2:05	0	74
1	1	181	1:54	1594	177	1	10	110	2:07	0	262
1	1	182	1:56	1777	78	1	10	111	2:53	0	180
1	1	183	2:00	1459	57	2	1	1	8:30	0	142
1	1	184	2:03	1342	65	2	1	2	8:30	148	109
1	1	185	2:04	1337	143	2	1	3	8:30	279	48
1	1	186	2:05	1440	49	2	1	4	8:30	360	76
1	1	187	2:05	1445	79	2	1	5	8:30	464	121
1	1	188	2:05	1560	76	2	1	6	8:30	720	133
1	1	189	2:07	1590	135	2	1	7	8:30	887	61
1	1	190	2:09	1575	54	2	1	8	8:30	946	132
1	1	191	2:10	1581	33	2	1	9	8:30	1054	75
1	1	192	2:12	1548	50	2	1	10	8:30	1099	370
1	1	193	2:13	1500	57	2	1	11	8:32	1380	71
1	1	194	2:26	721	37	2	1	12	8:32	1489	58
1	1	195	2:27	744	46	2	1	13	8:32	1791	238
1	1	196	2:32	518	94	2	1	14	8:32	1793	71
1	1	197	2:35	364	52	2	1	15	8:32	1842	63
1	1	198	2:38	252	51	2	1	16	8:34	1779	56
1	1	199	2:40	201	108	2	1	17	8:34	1843	70
1	1	200	2:44	93	304	2	1	18	8:36	1773	66
1	1	201	2:44	449	69	2	1	19	8:36	1827	63
1	1	202	2:45	440	90	2	1	20	8:37	1824	105
1	1	203	2:46	360	42	2	1	21	8:37	1959	70
1	1	204	2:48	368	25	2	1	22	8:40	1829	80

1	1	205	2:48	463	69	2	1	23	8:42	1749	545
1	1	206	2:49	454	79	2	1	24	8:44	2164	89
1	1	207	2:50	435	116	2	1	25	8:44	2315	70
1	1	208	2:52	439	58	2	1	26	8:46	2245	97
1	1	209	2:53	441	57	2	1	27	8:46	2388	74
1	1	210	2:54	444	43	2	1	28	8:47	2434	84
1	1	211	2:55	521	380	2	1	29	8:47	2470	149
1	1	212	2:58	681	237	2	1	30	8:49	2561	45
1	1	213	2:59	864	42	2	1	31	9:00	1976	113
1	2	1	8:30	582	60	2	1	32	9:00	1983	73
1	2	2	8:30	642	73	2	1	33	9:01	2090	64
1	2	3	8:30	689	65	2	1	34	9:04	1966	153
1	2	4	8:30	744	51	2	1	35	9:04	2066	119
1	2	5	8:30	813	113	2	1	36	9:09	1874	47
1	2	6	8:30	940	146	2	1	37	9:09	2127	106
1	2	7	8:30	1034	65	2	1	38	9:11	2220	60
1	2	8	8:30	1089	35	2	1	39	9:12	2940	142
1	2	9	8:30	1164	77	2	1	40	9:14	2978	64
1	2	10	8:30	1217	54	2	1	41	9:15	2974	135
1	2	11	8:30	1283	40	2	1	42	9:16	3011	123
1	2	12	8:30	1363	65	2	1	43	9:18	3120	80
1	2	13	8:30	1418	100	2	1	44	9:18	3220	132
1	2	14	8:30	1500	49	2	1	45	9:21	3148	351
1	2	15	8:30	1509	23	2	1	46	9:23	3397	147
1	2	16	8:30	1606	64	2	1	47	9:23	3490	291
1	2	17	8:30	1620	50	2	1	48	9:24	3739	126
1	2	18	8:30	1630	14	2	1	49	9:26	3733	24
1	2	19	8:30	1680	56	2	1	50	9:26	3829	78
1	2	20	8:30	1740	200	2	1	51	9:28	3751	82
1	2	21	8:30	2020	102	2	1	52	9:29	3729	155
1	2	22	8:30	2100	56	2	1	53	9:33	3694	135
1	2	23	8:30	2102	279	2	1	54	9:34	3739	31
1	2	24	8:30	2423	115	2	1	55	9:34	3828	86
1	2	25	8:30	2548	372	2	1	56	9:35	3802	39
1	2	26	8:30	2896	54	2	1	57	9:36	3780	36
1	2	27	8:31	2902	49	2	1	58	9:37	3744	39
1	2	28	8:31	2973	63	2	1	59	9:41	3585	66
1	2	29	8:32	2970	42	2	1	60	9:44	3420	36
1	2	30	8:32	3048	64	2	1	61	9:44	3444	27
1	2	31	8:33	3044	166	2	1	62	9:48	3297	71
1	2	32	8:34	3178	86	2	1	63	9:49	3286	75
1	2	33	8:35	3152	133	2	1	64	9:49	3331	45

1	2	34	8:37	3139	52	2	1	65	9:52	3300	73
1	2	35	8:37	3207	53	2	1	66	9:52	3360	26
1	2	36	8:38	3214	61	2	1	67	9:55	3214	55
1	2	37	8:39	3213	52	2	1	68	9:56	3339	46
1	2	38	8:42	3161	85	2	1	69	10:05	3353	144
1	2	39	8:42	3196	49	2	1	70	10:05	3449	116
1	2	40	8:47	2967	48	2	1	71	10:06	2893	35
1	2	41	8:47	3039	69	2	1	72	10:16	2398	70
1	2	42	8:49	2198	72	2	1	73	10:17	2460	183
1	2	43	8:50	2958	105	2	1	74	10:20	2517	626
1	2	44	8:51	2553	65	2	1	75	10:23	2911	133
1	2	45	8:52	3028	6	2	1	76	10:23	3018	55
1	2	46	8:54	2967	80	2	1	77	10:28	2783	52
1	2	47	9:01	2587	84	2	1	78	10:29	2791	62
1	2	48	9:02	2683	91	2	1	79	10:29	2849	115
1	2	49	9:03	2652	46	2	1	80	10:30	2914	135
1	2	50	9:09	2366	44	2	1	81	10:31	2959	174
1	2	51	9:11	2322	52	2	1	82	10:33	3025	49
1	2	52	9:13	3830	81	2	1	83	10:33	3096	47
1	2	53	9:15	2189	195	2	1	84	10:40	2749	85
1	2	54	9:17	2234	72	2	1	85	10:41	2724	51
1	2	55	9:18	2522	66	2	1	86	10:44	2613	434
1	2	56	9:21	2460	51	2	1	87	10:44	3019	36
1	2	57	9:22	2405	44	2	1	88	10:55	3060	79
1	2	58	9:24	2361	54	2	1	89	11:15	3180	69
1	2	59	9:25	2367	129	2	1	90	12:00	591	247
1	2	60	9:26	2418	184	2	1	91	12:04	584	143
1	2	61	9:29	2414	35	2	1	92	12:05	681	403
1	2	62	9:29	2499	48	2	1	93	12:10	780	213
1	2	63	9:30	2460	44	2	1	94	12:15	840	110
1	2	64	9:32	2356	61	2	1	95	12:18	2880	19
1	2	65	9:34	2295	122	2	1	96	12:20	665	82
1	2	66	9:35	2353	37	2	1	97	12:25	449	188
1	2	67	9:36	2376	36	2	1	98	12:27	501	34
1	2	68	9:39	2280	112	2	1	99	12:30	377	118
1	2	69	9:43	2108	41	2	1	100	12:32	379	35
1	2	70	9:44	2127	49	2	1	101	12:33	404	64
1	2	71	9:49	1898	40	2	1	102	12:33	460	80
1	2	72	9:51	1858	59	2	1	103	12:34	440	85
1	2	73	9:56	1619	77	2	1	104	12:35	535	72
1	2	74	9:58	1542	55	2	1	105	12:42	240	81
1	2	75	10:00	1487	107	2	1	106	12:44	360	155

1	2	76	10:03	1440	47	2	1	107	12:46	385	66
1	2	77	10:06	1273	39	2	1	108	12:51	199	227
1	2	78	10:07	1294	36	2	1	109	12:51	420	122
1	2	79	10:08	1318	73	2	1	110	12:53	540	43
1	2	80	10:09	1305	111	2	1	111	12:54	660	91
1	2	81	10:13	1140	42	2	1	112	1:01	329	65
1	2	82	10:13	1218	108	2	1	113	1:05	144	153
1	2	83	10:19	990	52	2	1	114	1:34	780	50
1	2	84	10:19	1058	62	2	1	115	1:36	670	30
1	2	85	10:20	1056	67	2	1	116	1:37	700	171
1	2	86	10:23	929	68	2	1	117	1:40	709	85
1	2	87	10:26	801	196	2	1	118	1:40	744	100
1	2	88	10:29	845	60	2	1	119	1:41	769	44
1	2	89	10:31	785	39	2	1	120	1:41	780	53
1	2	90	10:35	600	51	2	1	121	1:42	773	105
1	2	91	10:37	489	69	2	1	122	1:42	900	42
1	2	92	10:37	600	105	2	1	123	1:43	858	54
1	2	93	10:40	555	159	2	1	124	1:43	924	358
1	2	94	10:41	696	242	2	1	125	1:44	1226	227
1	2	95	10:42	874	303	2	1	126	1:48	1239	50
1	2	96	10:44	1051	119	2	1	127	1:49	1249	29
1	2	97	10:46	1052	42	2	1	128	2:00	571	31
1	2	98	10:49	950	75	2	1	129	2:00	649	49
1	2	99	10:51	845	35	2	1	130	2:01	600	47
1	2	100	10:53	780	30	2	1	131	2:02	553	506
1	2	101	10:55	690	150	2	1	132	2:03	1067	47
1	2	102	10:57	720	80	2	1	133	2:05	960	76
1	2	103	10:58	760	138	2	1	134	2:05	1064	317
1	2	104	10:59	802	55	2	1	135	2:06	1287	193
1	2	105	11:00	801	61	2	1	136	2:14	974	349
1	2	106	11:02	746	67	2	1	137	2:18	1105	66
1	2	107	11:05	619	171	2	1	138	2:21	979	58
1	2	108	11:07	622	82	2	1	139	2:22	1020	76
1	2	109	11:12	420	84	2	1	140	2:29	704	89
1	2	110	11:14	396	58	2	1	141	2:30	720	457
1	2	111	11:14	458	75	2	1	142	2:32	1043	101
1	2	112	11:16	383	53	2	1	143	2:35	1020	118
1	2	113	11:18	300	30	2	1	144	2:37	1020	79
1	2	114	11:19	300	20	2	1	145	2:44	691	41
1	2	115	11:20	240	40	2	1	146	2:45	619	63
1	2	116	11:20	300	106	2	1	147	2:45	676	114
1	2	117	11:22	314	119	2	1	148	2:45	802	34

1	2	118	11:22	435	97	2	1	149	2:46	828	56
1	2	119	11:24	458	60	2	1	150	2:48	772	104
1	2	120	11:27	300	38	2	1	151	2:48	788	23
1	2	121	11:29	240	116	2	1	152	2:49	825	64
1	2	122	11:30	304	104	2	1	153	2:51	761	61
1	2	123	11:31	380	69	2	1	154	2:52	760	152
1	2	124	11:31	431	71	2	1	155	2:53	788	253
1	2	125	11:33	420	94	2	1	156	2:54	1075	66
1	2	126	11:34	446	67	2	1	157	2:57	1020	53
1	2	127	11:35	439	48	2	1	158	2:57	1027	144
1	2	128	11:37	391	36	2	2	1	8:30	120	259
1	2	129	11:37	475	75	2	2	2	8:30	401	132
1	2	130	11:37	520	190	2	2	3	8:30	509	68
1	2	131	11:39	600	235	2	2	4	8:35	261	62
1	2	132	11:39	785	20	2	2	5	8:35	319	54
1	2	133	11:42	660	45	2	2	6	8:36	325	36
1	2	134	11:43	600	127	2	2	7	8:37	600	60
1	2	135	11:45	673	133	2	2	8	8:39	540	45
1	2	136	11:47	720	36	2	2	9	8:39	555	390
1	2	137	11:49	624	61	2	2	10	8:41	845	61
1	2	138	11:50	623	111	2	2	11	8:42	884	140
1	2	139	11:51	692	118	2	2	12	8:42	984	54
1	2	140	11:53	694	196	2	2	13	8:44	900	23
1	2	141	11:54	798	219	2	2	14	8:47	727	107
1	2	142	11:55	999	39	2	2	15	8:47	860	119
1	2	143	11:59	780	51	2	2	16	8:48	921	50
1	2	144	11:59	789	45	2	2	17	8:49	931	172
1	2	145	12:00	324	34	2	2	18	8:52	939	298
1	2	146	12:02	885	132	2	2	19	8:53	1500	87
1	2	147	12:04	873	38	2	2	20	8:53	1593	171
1	2	148	12:05	840	50	2	2	21	8:54	1722	71
1	2	149	12:06	785	85	2	2	22	8:56	1651	346
1	2	150	12:06	940	60	2	2	23	8:56	1980	45
1	2	151	12:10	760	50	2	2	24	8:59	1860	161
1	2	152	12:14	540	47	2	2	25	9:00	1939	185
1	2	153	12:15	540	99	2	2	26	9:03	1934	74
1	2	154	12:17	501	168	2	2	27	9:03	2640	194
1	2	155	12:19	573	113	2	2	28	9:04	3300	103
1	2	156	12:20	640	75	2	2	29	9:09	2760	135
1	2	157	12:22	565	72	2	2	30	9:11	4020	84
1	2	158	12:22	613	52	2	2	31	9:15	4020	104
1	2	159	12:24	561	26	2	2	32	9:17	3978	113

1	2	160	12:30	295	229	2	2	33	9:19	3983	41
1	2	161	12:31	366	92	2	2	34	9:21	3942	151
1	2	162	12:33	394	66	2	2	35	9:25	3791	462
1	2	163	12:36	240	28	2	2	36	9:27	4169	486
1	2	164	12:36	300	82	2	2	37	9:28	4583	51
1	2	165	12:41	98	38	2	2	38	9:30	4532	43
1	2	166	12:41	120	42	2	2	39	9:33	4429	333
1	2	167	1:13	540	125	2	2	40	9:37	4456	253
1	2	168	1:22	120	50	2	2	41	9:38	4623	57
1	2	169	1:22	125	41	2	2	42	9:40	4566	38
1	2	170	1:23	144	111	2	2	43	9:46	4288	347
1	2	171	1:23	273	41	2	2	44	9:54	4181	90
1	2	172	1:24	292	67	2	2	45	10:00	3851	242
1	2	173	1:27	120	43	2	2	46	10:07	3720	73
1	2	174	1:28	62	57	2	2	47	10:42	1727	62
1	2	175	1:30	0	30	2	2	48	10:44	1665	145
1	2	176	1:35	0	91	2	2	49	10:51	980	98
1	2	177	1:38	0	60	2	2	50	10:52	1384	27
1	2	178	1:42	0	96	2	2	51	10:54	1357	67
1	2	179	1:42	84	65	2	2	52	10:57	1230	110
1	2	180	1:42	139	62	2	2	53	10:57	1360	420
1	2	181	1:42	197	77	2	2	54	10:59	1660	58
1	2	182	1:47	0	112	2	2	55	11:00	1662	92
1	2	183	1:47	68	68	2	2	56	11:14	850	93
1	2	184	1:48	120	30	2	2	57	11:16	840	1557
1	2	185	1:54	0	96	2	2	58	11:24	1867	75
1	2	186	1:54	84	84	2	2	59	11:27	1860	75
1	2	187	1:56	60	180	2	2	60	11:33	1605	65
1	2	188	1:58	120	60	2	2	61	11:44	1000	43
1	2	189	2:02	180	88	2	2	62	11:50	717	87
1	2	190	2:03	212	74	2	2	63	11:53	570	151
1	2	191	2:04	198	56	2	2	64	11:59	419	77
1	2	192	2:05	202	351	2	2	65	11:59	462	82
1	2	193	2:07	391	145	2	2	66	12:00	660	297
1	2	194	2:09	366	57	2	2	67	12:00	960	72
1	2	195	2:13	189	91	2	2	68	12:02	1020	40
1	2	196	2:15	218	428	2	2	69	12:05	728	199
1	2	197	2:15	630	194	2	2	70	12:06	949	61
1	2	198	2:18	612	106	2	2	71	12:16	408	116
1	2	199	2:18	720	30	2	2	72	12:18	412	347
1	2	200	2:22	540	79	2	2	73	12:20	600	185
1	2	201	2:28	244	91	2	2	74	12:24	595	286

1	2	202	2:29	300	33	2	2	75	12:25	780	63
1	2	203	2:31	240	56	2	2	76	12:27	773	58
1	2	204	2:32	184	54	2	2	77	12:30	655	113
1	2	205	2:32	250	51	2	2	78	12:34	480	62
1	2	206	2:32	309	91	2	2	79	12:35	538	100
1	2	207	2:36	216	98	2	2	80	12:35	558	38
1	2	208	2:37	300	95	2	2	81	12:36	580	62
1	2	209	2:37	385	67	2	2	82	12:36	638	96
1	2	210	2:38	378	56	2	2	83	12:38	542	71
1	2	211	2:44	82	67	2	2	84	12:39	660	177
1	2	212	2:44	135	75	2	2	85	12:41	663	36
1	2	213	2:46	120	60	2	2	86	12:42	687	50
1	2	214	2:43	120	69	2	2	87	12:47	540	60
1	2	215	2:47	180	31	2	2	88	12:48	540	84
1	2	216	2:50	0	53	2	2	89	12:49	576	38
1	2	217	2:51	0	774	2	2	90	12:49	600	58
1	2	218	2:51	180	107	2	2	91	12:50	600	115
1	2	219	2:52	133	307	2	2	92	12:54	365	55
1	2	220	2:52	426	210	2	2	93	12:55	430	186
1	2	221	2:53	636	279	2	2	94	12:56	600	83
1	2	222	2:53	957	78	2	2	95	12:58	57	100
1	3	1	8:30	539	119	2	2	96	1:00	597	114
1	3	2	8:30	600	60	2	2	97	1:00	660	50
1	3	3	8:30	720	44	2	2	98	1:01	610	63
1	3	4	8:30	736	76	2	2	99	1:04	487	133
1	3	5	8:30	840	116	2	2	100	1:07	534	61
1	3	6	8:30	904	64	2	2	101	1:08	533	76
1	3	7	8:30	1020	24	2	2	102	1:09	517	112
1	3	8	8:30	1056	96	2	2	103	1:13	405	121
1	3	9	8:30	1140	55	2	2	104	1:21	0	364
1	3	10	8:30	1145	65	2	2	105	1:38	0	116
1	3	11	8:30	1260	159	2	2	106	1:41	0	91
1	3	12	8:30	1401	81	2	2	107	2:22	900	417
1	3	13	8:30	1680	60	2	2	108	2:26	1080	165
1	3	14	8:30	1740	50	2	2	109	2:31	960	106
1	3	15	8:30	1750	48	2	2	110	2:36	734	234
1	3	16	8:30	1822	49	2	2	111	2:37	1020	66
1	3	17	8:30	1860	30	2	2	112	2:44	720	85
1	3	18	8:30	1863	23	2	2	113	2:47	635	393
1	3	19	8:30	1920	34	2	2	114	2:53	660	396
1	3	20	8:30	1926	83	2	3	1	8:30	480	79
1	3	21	8:30	2083	49	2	3	2	8:30	581	117

1	3	22	8:30	2100	49	2	3	3	8:30	660	36
1	3	23	8:30	2105	41	2	3	4	8:34	428	84
1	3	24	8:30	2184	47	2	3	5	8:36	600	46
1	3	25	8:31	2197	42	2	3	6	8:36	780	141
1	3	26	8:33	2100	52	2	3	7	8:37	279	50
1	3	27	8:33	2103	46	2	3	8	8:45	420	91
1	3	28	8:33	2177	22	2	3	9	8:49	360	46
1	3	29	8:33	2220	53	2	3	10	8:50	314	112
1	3	30	8:33	2222	37	2	3	11	8:50	480	192
1	3	31	8:34	2245	34	2	3	12	8:53	1140	77
1	3	32	8:34	2280	48	2	3	13	8:53	1243	74
1	3	33	8:34	2283	24	2	3	14	8:57	1049	110
1	3	34	8:34	2340	35	2	3	15	8:58	1119	157
1	3	35	8:35	2284	244	2	3	16	8:58	1208	214
1	3	36	8:35	2520	151	2	3	17	8:59	1440	258
1	3	37	8:36	2609	75	2	3	18	8:59	1860	177
1	3	38	8:36	2654	64	2	3	19	8:59	2040	147
1	3	39	8:36	2710	49	2	3	20	8:59	2193	749
1	3	40	8:36	2781	58	2	3	21	9:00	2880	235
1	3	41	8:37	2963	143	2	3	22	9:00	3065	94
1	3	42	8:37	3120	81	2	3	23	9:01	3271	67
1	3	43	8:39	3099	73	2	3	24	9:01	3780	100
1	3	44	8:39	3146	131	2	3	25	9:02	3800	90
1	3	45	8:39	3255	107	2	3	26	9:02	3950	70
1	3	46	8:40	3328	81	2	3	27	9:06	4480	55
1	3	47	8:40	3367	97	2	3	28	9:06	3825	110
1	3	48	8:40	3510	192	2	3	29	9:13	3535	77
1	3	49	8:42	3558	138	2	3	30	9:13	3578	562
1	3	50	8:42	3720	40	2	3	31	9:13	4091	50
1	3	51	8:42	3740	44	2	3	32	9:14	4101	41
1	3	52	8:43	3756	46	2	3	33	9:14	4180	448
1	3	53	8:43	3830	71	2	3	34	9:18	4332	57
1	3	54	8:44	3819	41	2	3	35	9:19	4335	102
1	3	55	8:44	3898	92	2	3	36	9:21	4353	78
1	3	56	8:44	3926	124	2	3	37	9:21	4440	107
1	3	57	8:45	3982	52	2	3	38	9:23	4393	122
1	3	58	8:46	3990	68	2	3	39	9:24	4451	86
1	3	59	8:46	4042	1159	2	3	40	9:25	4545	334
1	3	60	8:47	5103	88	2	3	41	9:26	4751	66
1	3	61	8:48	5195	123	2	3	42	9:27	4745	112
1	3	62	8:50	5192	34	2	3	43	9:28	4813	115
1	3	63	8:51	5213	353	2	3	44	9:28	4932	621

1	3	64	8:58	5100	159	2	3	45	9:29	5631	81
1	3	65	8:59	5181	36	2	3	46	9:30	5610	78
1	3	66	8:59	5265	60	2	3	47	9:31	5592	32
1	3	67	9:03	5085	255	2	3	48	9:31	5680	250
1	3	68	9:04	5250	116	2	3	49	9:31	5910	110
1	3	69	9:04	5340	34	2	3	50	9:31	6040	55
1	3	70	9:05	5366	136	2	3	51	9:32	6045	93
1	3	71	9:05	5470	130	2	3	52	9:32	6072	75
1	3	72	9:07	5520	47	2	3	53	9:32	6180	42
1	3	73	9:07	5533	73	2	3	54	9:35	6015	312
1	3	74	9:08	5580	49	2	3	55	9:37	6183	248
1	3	75	9:08	5591	45	2	3	56	9:37	6595	75
1	3	76	9:09	5606	52	2	3	57	9:38	6580	65
1	3	77	9:10	5614	36	2	3	58	9:38	6635	64
1	3	78	9:10	5698	107	2	3	59	9:39	7111	40
1	3	79	9:11	5651	191	2	3	60	9:40	6651	94
1	3	80	9:11	5880	105	2	3	61	9:42	6557	302
1	3	81	9:15	5715	102	2	3	62	9:44	6735	333
1	3	82	9:15	5853	75	2	3	63	9:44	7122	42
1	3	83	9:16	5838	52	2	3	64	9:48	6900	50
1	3	84	9:16	5906	49	2	3	65	9:48	7020	234
1	3	85	9:17	5880	37	2	3	66	9:48	7260	65
1	3	86	9:17	5943	48	2	3	67	9:49	7260	48
1	3	87	9:20	5772	132	2	3	68	9:51	7147	105
1	3	88	9:20	5940	492	2	3	69	9:52	7222	72
1	3	89	9:28	5688	102	2	3	70	9:53	7210	55
1	3	90	9:28	5706	42	2	3	71	9:57	7025	50
1	3	91	9:28	5784	72	2	3	72	9:58	7035	65
1	3	92	9:30	5709	129	2	3	73	9:58	7090	312
1	3	93	9:33	5700	191	2	3	74	9:59	7438	63
1	3	94	9:33	5880	49	2	3	75	10:00	7435	781
1	3	95	9:34	5880	51	2	3	76	10:00	8214	74
1	3	96	9:34	5889	263	2	3	77	10:01	8200	157
1	3	97	9:36	6060	46	2	3	78	10:06	8040	418
1	3	98	9:38	5954	134	2	3	79	10:06	8460	70
1	3	99	9:40	6000	314	2	3	80	10:06	8570	169
1	3	100	9:42	6226	78	2	3	81	10:08	8580	107
1	3	101	9:45	6088	65	2	3	82	10:08	8653	63
1	3	102	9:45	6143	113	2	3	83	10:09	8690	247
1	3	103	9:46	6180	30	2	3	84	10:10	8880	176
1	3	104	9:47	6180	264	2	3	85	10:11	8944	122
1	3	105	9:47	6456	93	2	3	86	10:12	9060	168

1	3	106	9:54	6063	44	2	3	87	10:14	9120	69
1	3	107	9:55	6079	103	2	3	88	10:28	8391	109
1	3	108	9:56	6156	65	2	3	89	10:32	8220	64
1	3	109	9:56	6211	64	2	3	90	10:34	8220	100
1	3	110	10:02	5907	32	2	3	91	10:40	7980	115
1	3	111	10:03	5935	58	2	3	92	10:44	7860	55
1	3	112	10:04	5933	61	2	3	93	10:54	7265	123
1	3	113	10:04	5940	52	2	3	94	10:56	7320	105
1	3	114	10:05	5940	53	2	3	95	11:02	7080	47
1	3	115	10:07	5827	67	2	3	96	11:04	6913	72
1	3	116	10:13	5880	38	2	3	97	11:08	6900	105
1	3	117	10:18	5302	33	2	3	98	11:10	6855	170
1	3	118	10:21	5209	79	2	3	99	11:16	6685	100
1	3	119	10:25	5010	130	2	3	100	11:29	6045	185
1	3	120	10:26	5060	108	2	3	101	11:35	5860	145
1	3	121	10:26	5192	57	2	3	102	11:43	5475	60
1	3	122	10:29	5075	210	2	3	103	11:44	5475	65
1	3	123	10:29	5225	65	2	3	104	11:46	5470	165
1	3	124	10:29	5314	141	2	3	105	12:03	4405	54
1	3	125	10:30	5439	48	2	3	106	12:07	4471	51
1	3	126	10:31	5451	77	2	3	107	12:20	3760	50
1	3	127	10:35	5254	34	2	3	108	12:27	3410	75
1	3	128	10:36	5252	411	2	3	109	12:28	3395	170
1	3	129	10:36	5671	91	2	3	110	12:40	2865	75
1	3	130	10:39	5580	30	2	3	111	12:49	2370	79
1	3	131	10:42	5400	30	2	3	112	12:51	2340	190
1	3	132	10:47	5160	90	2	3	113	12:59	2100	49
1	3	133	10:47	5250	45	2	3	114	1:04	1801	177
1	3	134	10:49	5205	73	2	3	115	1:09	1684	77
1	3	135	10:58	4712	86	2	3	116	1:09	1847	104
1	3	136	10:58	4746	38	2	3	117	1:23	1023	446
1	3	137	11:00	4080	69	2	3	118	2:11	900	56
1	3	138	11:06	4399	52	2	3	119	2:13	844	58
1	3	139	11:18	3746	71	2	3	120	2:13	906	51
1	3	140	11:27	3256	72	2	3	121	2:14	915	72
1	3	141	11:34	2884	64	2	3	122	2:15	903	62
1	3	142	11:38	2760	86	2	3	123	2:16	960	60
1	3	143	11:47	2280	26	2	3	124	2:18	900	55
1	3	144	11:49	2168	41	2	3	125	2:20	840	59
1	3	145	11:51	2127	47	2	3	126	2:29	360	127
1	3	146	11:59	1720	126	2	3	127	2:30	660	175
1	3	147	12:03	1594	206	2	3	128	2:33	605	173

1	3	148	12:07	1508	95	2	3	129	2:35	672	118
1	3	149	12:09	1533	39	2	3	130	2:36	734	193
1	3	150	12:11	1494	97	2	3	131	2:36	960	363
1	3	151	12:20	977	22	2	3	132	2:37	1317	57
1	3	152	12:27	655	86	2	3	133	2:39	1200	121
1	3	153	12:28	629	310	2	3	134	2:40	1319	404
1	3	154	12:40	199	279	2	3	135	2:41	1860	45
1	3	155	12:47	100	100	2	3	136	2:43	2160	299
1	3	156	1:35	0	60	2	3	137	2:45	2340	345
1	3	157	1:35	60	41	2	3	138	2:48	2520	210
1	3	158	1:36	0	59	2	3	139	2:50	2610	144
1	3	159	1:36	620	680	2	3	140	2:50	2706	112
1	3	160	1:38	660	60	2	3	141	2:55	2580	119
1	3	161	1:39	660	89	2	3	142	2:28	2520	280
1	3	162	1:41	631	249	2	4	1	8:30	300	260
1	3	163	1:42	802	202	2	4	2	8:30	580	45
1	3	164	1:42	1020	120	2	4	3	8:30	655	85
1	3	165	1:43	1080	281	2	4	4	8:30	720	65
1	3	166	1:45	1159	294	2	4	5	8:30	835	65
1	3	167	1:47	1345	116	2	4	6	8:30	890	229
1	3	168	1:48	1409	269	2	4	7	8:30	1080	176
1	3	169	1:50	1560	60	2	4	8	8:34	1020	73
1	3	170	1:50	1620	63	2	4	9	8:34	1440	407
1	3	171	1:50	1737	52	2	4	10	8:44	1213	63
1	3	172	1:51	1625	99	2	4	11	8:44	1270	30
1	3	173	1:51	1766	116	2	4	12	8:44	1360	110
1	3	174	1:52	1770	33	2	4	13	8:44	1500	287
1	3	175	1:52	1800	57	2	4	14	8:47	1573	29
1	3	176	1:55	1680	89	2	4	15	8:49	1544	400
1	3	177	1:56	1711	116	2	4	16	8:49	1864	352
1	3	178	1:59	1655	87	2	4	17	8:49	2232	149
1	3	179	2:01	1568	68	2	4	18	8:51	1963	184
1	3	180	2:02	1620	45	2	4	19	8:57	2139	97
1	3	181	2:02	1635	315	2	4	20	8:58	2102	38
1	3	182	2:02	1980	34	2	4	21	9:02	1944	62
1	3	183	2:02	2006	77	2	4	22	9:04	1882	131
1	3	184	2:03	1989	150	2	4	23	9:05	1931	127
1	3	185	2:04	2139	91	2	4	24	9:06	2100	173
1	3	186	2:05	2108	23	2	4	25	9:06	2227	120
1	3	187	2:09	1965	125	2	4	26	9:09	2167	707
1	3	188	2:11	1960	70	2	4	27	9:09	3840	66
1	3	189	2:13	1890	90	2	4	28	9:10	3894	74

1	3	190	2:13	1980	117	2	4	29	9:13	3720	96
1	3	191	2:14	1983	153	2	4	30	9:14	3744	104
1	3	192	2:15	2100	30	2	4	31	9:14	3880	263
1	3	193	2:16	2100	45	2	4	32	9:14	4140	417
1	3	194	2:18	1995	52	2	4	33	9:15	4443	110
1	3	195	2:20	1943	71	2	4	34	9:16	4513	80
1	3	196	2:29	1452	72	2	4	35	9:16	4620	50
1	3	197	2:35	1200	51	2	4	36	9:18	4503	100
1	3	198	2:36	1149	249	2	4	37	9:18	4643	69
1	3	199	2:37	1380	109	2	4	38	9:21	4694	349
1	3	200	2:39	1331	42	2	4	39	9:21	4765	133
1	3	201	2:40	1349	45	2	4	40	9:24	4812	56
1	3	202	2:41	1364	164	2	4	41	9:24	4876	52
1	3	203	2:48	1980	89	2	4	42	9:25	4884	131
1	3	204	2:50	1951	190	2	4	43	9:25	4993	159
1	3	205	2:50	2181	38	2	4	44	9:33	4714	67
1	3	206	2:50	2263	148	2	4	45	9:34	4707	40
1	3	207	2:51	2295	117	2	4	46	9:34	4787	93
1	3	208	2:54	2238	57	2	4	47	9:34	4814	35
1	3	209	2:55	2241	116	2	4	48	9:37	4719	98
1	3	210	2:56	2305	85	2	4	49	9:37	4800	176
1	3	211	2:57	2340	207	2	4	50	9:37	5100	221
1	3	212	2:58	2460	273	2	4	51	9:38	5280	62
1	4	1	8:30	1020	60	2	4	52	9:38	5342	58
1	4	2	8:30	1080	229	2	4	53	9:38	5580	95
1	4	3	8:30	1331	110	2	4	54	9:38	5665	71
1	4	4	8:30	1466	132	2	4	55	9:42	5474	55
1	4	5	8:30	1574	38	2	4	56	9:42	5539	45
1	4	6	8:30	1656	241	2	4	57	9:47	5340	107
1	4	7	8:30	1895	80	2	4	58	9:49	5520	76
1	4	8	8:30	1935	88	2	4	59	9:49	5624	60
1	4	9	8:30	2040	45	2	4	60	9:53	5400	239
1	4	10	8:30	2042	49	2	4	61	9:53	5640	86
1	4	11	8:30	2130	204	2	4	62	9:55	5614	51
1	4	12	8:30	2389	76	2	4	63	9:56	5623	49
1	4	13	8:30	2400	33	2	4	64	9:57	5634	65
1	4	14	8:30	2460	31	2	4	65	10:01	4249	72
1	4	15	8:30	2489	35	2	4	66	10:01	5460	88
1	4	16	8:30	2520	162	2	4	67	10:05	5312	173
1	4	17	8:30	2652	42	2	4	68	10:12	5079	54
1	4	18	8:30	2700	30	2	4	69	10:13	5085	258
1	4	19	8:30	2760	84	2	4	70	10:13	5307	51

1	4	20	8:30	2856	84	2	4	71	10:13	5376	78
1	4	21	8:30	5892	79	2	4	72	10:17	5178	135
1	4	22	8:30	3000	50	2	4	73	10:17	5340	89
1	4	23	8:30	3003	50	2	4	74	10:17	5431	80
1	4	24	8:33	2893	47	2	4	75	10:20	5291	109
1	4	25	8:33	2966	45	2	4	76	10:23	5242	46
1	4	26	8:33	3031	47	2	4	77	10:24	5254	92
1	4	27	8:33	3104	55	2	4	78	10:24	5282	118
1	4	28	8:33	3120	45	2	4	79	10:26	5284	119
1	4	29	8:33	3124	116	2	4	80	10:26	5405	512
1	4	30	8:35	3128	55	2	4	81	10:29	6000	221
1	4	31	8:35	3193	115	2	4	82	10:29	6720	109
1	4	32	8:35	3318	24	2	4	83	10:31	7200	76
1	4	33	8:35	3360	54	2	4	84	10:36	3404	92
1	4	34	8:40	3120	53	2	4	85	10:36	7032	49
1	4	35	8:40	3127	86	2	4	86	10:39	7523	84
1	4	36	8:40	3281	41	2	4	87	10:42	6840	59
1	4	37	8:40	3300	42	2	4	88	10:46	6660	97
1	4	38	8:40	3318	47	2	4	89	10:53	6323	52
1	4	39	8:40	3391	35	2	4	90	10:54	6360	458
1	4	40	8:43	3296	221	2	4	91	10:57	6960	238
1	4	41	8:43	3435	39	2	4	92	12:57	0	345
1	4	42	8:43	3480	36	2	4	93	1:02	0	49
1	4	43	8:43	3540	37	2	4	94	10:03	0	332
1	4	44	8:43	3563	103	2	4	95	1:04	344	200
1	4	45	8:43	3700	236	2	4	96	1:05	300	107
1	4	46	8:43	3944	44	2	4	97	1:07	253	72
1	4	47	8:43	3960	75	2	4	98	1:09	240	85
1	4	48	8:43	4065	87	2	4	99	1:10	275	132
1	4	49	8:44	4038	178	2	4	100	1:11	323	39
1	4	50	8:45	4160	122	2	4	101	1:12	480	205
1	4	51	8:46	4278	44	2	4	102	1:15	515	47
1	4	52	8:47	4774	41	2	4	103	1:17	468	95
1	4	53	8:47	4800	62	2	4	104	1:20	360	103
1	4	54	8:48	4800	51	2	4	105	1:23	257	839
1	4	55	8:48	4860	77	2	4	106	1:23	1080	57
1	4	56	9:11	7183	46	2	4	107	1:23	1200	440
1	4	57	9:11	7200	43	2	4	108	1:24	1600	338
1	4	58	9:11	7214	49	2	4	109	1:44	2760	77
1	4	59	9:11	7285	36	2	4	110	1:55	2640	64
1	4	60	9:11	7369	62	2	4	111	1:56	2199	135
1	4	61	9:11	7380	46	2	4	112	1:59	2124	433

1	4	62	9:11	7383	42	2	4	113	2:00	2471	68
1	4	63	9:15	7221	46	2	4	114	2:10	1980	59
1	4	64	9:15	7295	40	2	4	115	2:14	1800	167
1	4	65	9:15	7320	55	2	4	116	2:18	2160	156
1	4	66	9:26	6720	60	2	4	117	2:32	1620	166
1	4	67	9:26	6840	60	2	4	118	2:46	914	67
1	4	68	9:26	6900	92	2	4	119	2:46	967	34
1	4	69	9:26	6988	28	2	4	120	2:47	993	55
1	4	70	9:26	7020	37	2	4	121	2:48	1020	107
1	4	71	9:27	6973	83	2	4	122	2:49	1080	60
1	4	72	9:27	7070	225	2	4	123	2:50	1080	63
1	4	73	9:27	7205	217	2	4	124	2:52	1077	104
1	4	74	9:27	7468	51	2	4	125	2:56	900	173
1	4	75	9:35	7057	97	2	4	126	3:00	87	153
1	4	76	9:35	7140	165	2	4	127	3:00	1380	116
1	4	77	9:35	7275	167	2	5	1	8:30	780	195
1	4	78	9:35	7468	65	2	5	2	8:30	1005	191
1	4	79	9:35	7523	171	2	5	3	8:30	1174	69
1	4	80	9:36	7652	47	2	5	4	8:32	1105	60
1	4	81	9:36	7680	35	2	5	5	8:38	840	147
1	4	82	9:36	7740	43	2	5	6	8:40	873	69
1	4	83	9:36	7757	44	2	5	7	8:42	840	107
1	4	84	9:36	7833	55	2	5	8	8:50	540	177
1	4	85	9:39	7718	150	2	5	9	8:52	660	106
1	4	86	9:39	7808	60	2	5	10	8:54	614	1210
1	4	87	9:59	6668	42	2	5	11	10:00	360	510
1	4	88	9:59	6746	154	2	5	12	10:05	570	1277
1	4	89	9:59	6952	482	2	5	13	10:07	2460	122
1	4	90	9:59	7430	188	2	5	14	10:10	2280	58
1	4	91	9:59	7602	42	2	5	15	10:12	2220	99
1	4	92	9:59	7620	89	2	5	16	10:14	2181	67
1	4	93	10:14	3211	36	2	5	17	10:15	2340	90
1	4	94	10:14	3240	47	2	5	18	10:20	2130	73
1	4	95	10:14	3248	48	2	5	19	10:21	2127	78
1	4	96	10:14	3320	107	2	5	20	10:23	2049	235
1	4	97	10:14	3420	33	2	5	21	10:30	1874	190
1	4	98	10:14	3480	148	2	5	22	10:36	1686	119
1	4	99	10:24	3032	38	2	5	23	10:42	1447	288
1	4	100	10:24	3060	37	2	5	24	10:46	1519	176
1	4	101	10:28	2835	40	2	5	25	10:49	1523	129
1	4	102	10:28	2915	45	2	5	26	10:50	1560	96
1	4	103	10:35	2520	37	2	5	27	10:55	1380	79

1	4	104	10:38	2353	42	2	5	28	11:02	1061	367
1	4	105	10:38	2431	91	2	5	29	11:05	1234	153
1	4	106	10:44	2160	83	2	5	30	11:06	1320	116
1	4	107	10:44	2257	118	2	5	31	11:07	1324	130
1	4	108	10:44	2439	120	2	5	32	11:10	1320	47
1	4	109	10:44	2559	54	2	5	33	11:13	1147	153
1	4	110	10:44	2625	90	2	5	34	11:18	1054	80
1	4	111	10:45	2595	29	2	5	35	11:18	1140	216
1	4	112	10:45	2691	231	2	5	36	11:21	1560	286
1	4	113	10:47	2760	75	2	5	37	11:25	1740	161
1	4	114	10:47	2865	97	2	5	38	11:28	1699	49
1	4	115	10:47	2888	94	2	5	39	11:29	1800	156
1	4	116	10:49	2914	51	2	5	40	11:32	1764	381
1	4	117	10:49	2940	43	2	5	41	11:33	2100	336
1	4	118	11:06	1980	60	2	5	42	11:34	2364	38
1	4	119	11:06	2040	36	2	5	43	11:36	2280	46
1	4	120	11:10	1824	59	2	5	44	11:38	2220	216
1	4	121	11:10	1885	85	2	5	45	11:40	2364	181
1	4	122	11:13	1800	95	2	5	46	11:58	1463	39
1	4	123	11:16	1705	107	2	5	47	12:01	1364	85
1	4	124	11:16	1838	38	2	5	48	12:03	1279	115
1	4	125	11:20	1620	51	2	5	49	12:05	1284	65
1	4	126	11:20	1629	72	2	5	50	12:08	1159	85
1	4	127	11:20	1800	50	2	5	51	12:09	1254	99
1	4	128	11:22	1687	123	2	5	52	12:11	1155	101
1	4	129	11:22	1804	124	2	5	53	12:13	1174	75
1	4	130	11:30	1500	83	2	5	54	12:16	1039	55
1	4	131	11:30	1597	65	2	5	55	12:16	1140	60
1	4	132	11:44	812	152	2	5	56	12:19	1080	224
1	4	133	11:44	960	160	2	5	57	12:21	1156	195
1	4	134	11:50	740	80	2	5	58	12:24	1200	780
1	4	135	11:54	540	125	2	5	59	12:29	1380	297
1	4	136	11:56	540	45	2	5	60	12:37	1143	167
1	4	137	11:56	550	248	2	5	61	12:39	1216	155
1	4	138	11:58	662	82	2	5	62	12:40	1361	170
1	4	139	11:58	820	44	2	5	63	12:40	1551	105
1	4	140	12:00	776	71	2	5	64	12:42	1446	63
1	4	141	12:01	765	93	2	5	65	12:50	1023	159
1	4	142	12:01	792	50	2	5	66	12:57	804	127
1	4	143	12:04	682	22	2	5	67	1:06	377	113
1	4	144	12:04	720	175	2	5	68	1:10	300	149
1	4	145	12:05	705	298	2	5	69	1:12	331	172

1	4	146	12:08	907	400	2	5	70	1:16	279	94
1	4	147	12:13	987	144	2	5	71	1:16	305	206
1	4	148	12:17	903	28	2	5	72	1:19	399	95
1	4	149	12:21	780	56	2	5	73	1:19	424	25
1	4	150	12:21	784	49	2	5	74	1:22	339	50
1	4	151	12:23	735	39	2	5	75	1:23	349	64
1	4	152	12:27	540	32	2	5	76	1:23	405	386
1	4	153	12:30	420	51	2	5	77	1:24	360	412
1	4	154	12:32	309	45	2	5	78	1:25	668	109
1	4	155	12:36	144	89	2	5	79	1:26	739	546
1	4	156	12:36	295	98	2	5	80	2:02	780	76
1	4	157	12:37	257	55	2	5	81	2:05	660	50
1	4	158	12:38	262	72	2	5	82	2:05	720	287
1	4	159	12:39	250	55	2	5	83	2:07	853	49
1	4	160	12:39	315	31	2	5	84	2:09	804	68
1	4	161	12:40	884	115	2	5	85	2:11	736	132
1	4	162	12:41	380	49	2	5	86	2:13	724	106
1	4	163	12:42	371	38	2	5	87	2:16	378	84
1	4	164	12:43	180	28	2	5	88	2:17	720	54
1	4	165	12:44	245	20	2	5	89	2:20	600	110
1	4	166	12:44	0	171	2	5	90	2:20	670	37
1	4	167	12:45	420	54	2	5	91	2:21	693	51
1	4	168	12:46	420	51	2	5	92	2:22	702	81
1	4	169	12:47	369	61	2	5	93	2:23	681	228
1	4	170	12:51	188	55	2	5	94	2:24	873	66
1	4	171	12:51	253	53	2	5	95	2:26	807	146
1	4	172	12:53	200	200	2	5	96	2:29	780	87
1	4	173	1:23	1020	46	2	5	97	2:31	753	124
1	4	174	1:23	1034	46	2	5	98	2:31	869	282
1	4	175	1:25	988	118	2	5	99	2:32	1247	89
1	4	176	1:26	1050	67	2	5	100	2:32	1260	1007
1	4	177	1:26	1103	93	2	5	101	2:34	2113	159
1	4	178	1:28	1080	38	2	5	102	2:37	2074	240
1	4	179	1:30	972	120	2	5	103	2:38	2280	156
1	4	180	1:30	1092	50	2	5	104	2:38	2424	234
1	4	181	1:30	1154	134	2	5	105	2:51	1890	103
1	4	182	1:35	1020	115	2	5	106	2:53	1860	56
1	4	183	1:39	845	104	2	5	107	2:53	2760	84
1	4	184	1:42	801	27	2	5	108	2:54	2796	133
1	4	185	1:44	774	83	2	5	109	3:00	2543	100
1	4	186	1:54	180	31	2	5	110	3:03	2503	146
1	4	187	1:54	240	80	2	5	111	3:03	2597	45

1	4	188	1:56	220	181	2	5	112	3:04	2612	74
1	4	189	1:56	399	76	2	6	1	8:30	300	56
1	4	190	1:57	383	113	2	6	2	8:30	380	31
1	4	191	1:58	450	76	2	6	3	8:30	389	88
1	4	192	1:59	434	93	2	6	4	8:30	480	156
1	4	193	2:00	521	50	2	6	5	8:36	264	110
1	4	194	2:01	471	87	2	6	6	8:36	394	72
1	4	195	2:07	204	52	2	6	7	8:36	142	128
1	4	196	2:09	152	61	2	6	8	8:40	314	239
1	4	197	2:10	151	72	2	6	9	8:41	495	91
1	4	198	2:10	199	66	2	6	10	8:41	600	46
1	4	199	2:12	133	125	2	6	11	8:48	300	114
1	4	200	2:14	128	188	2	6	12	8:48	420	102
1	4	201	2:14	360	50	2	6	13	8:52	258	54
1	4	202	2:15	310	171	2	6	14	8:52	324	22
1	4	203	2:17	439	79	2	6	15	8:54	254	79
1	4	204	2:18	480	37	2	6	16	0:00	295	114
1	4	205	2:19	443	47	2	6	17	8:58	240	228
1	4	206	2:20	516	129	2	6	18	8:58	432	307
1	4	207	2:21	540	27	2	6	19	8:59	665	56
1	4	208	2:22	540	85	2	6	20	9:00	669	125
1	4	209	2:24	3395	35	2	6	21	9:00	784	210
1	4	210	2:45	480	33	2	6	22	9:01	994	47
1	4	211	2:32	87	200	2	6	23	9:01	1067	47
1	4	212	2:33	180	110	2	6	24	9:01	1026	156
1	4	213	2:35	130	70	2	6	25	9:06	924	132
1	4	214	2:36	180	35	2	6	26	9:07	972	62
1	4	215	2:37	145	68	2	6	27	9:07	1030	50
1	4	216	2:38	137	39	2	6	28	9:08	1260	90
1	4	217	2:38	218	38	2	6	29	9:09	1290	109
1	4	218	2:39	180	60	2	6	30	9:10	1361	48
1	4	219	2:39	240	60	2	6	31	9:13	1200	53
1	4	220	2:40	240	60	2	6	32	9:13	1260	55
1	4	221	2:40	300	51	2	6	33	9:14	1260	87
1	4	222	2:40	309	54	2	6	34	9:15	1293	134
1	4	223	2:40	375	43	2	6	35	9:15	1399	57
1	4	224	2:40	452	85	2	6	36	9:15	1462	63
1	4	225	2:40	487	35	2	6	37	9:15	1459	220
1	4	226	2:42	452	598	2	6	38	9:17	1659	75
1	4	227	2:42	994	94	2	6	39	9:17	2400	58
1	4	228	2:46	1260	111	2	6	40	9:20	2280	294
1	4	229	2:49	1149	129	2	6	41	9:24	2340	97

1	4	230	2:49	1320	146	2	6	42	9:28	2183	38
1	4	231	2:49	1474	75	2	6	43	9:30	2145	83
1	4	232	2:50	1459	90	2	6	44	9:30	2182	112
1	4	233	2:52	1487	103	2	6	45	9:35	2160	57
1	4	234	2:53	1446	63	2	6	46	9:35	2163	46
1	4	235	2:54	1447	87	2	6	47	9:36	2177	227
1	4	236	2:55	1500	40	2	6	48	9:37	2370	70
1	4	237	2:57	1440	90	2	6	49	9:38	2400	146
1	4	238	2:57	1530	66	2	6	50	9:43	2254	99
1	4	239	2:58	1524	35	2	6	51	9:43	2340	47
1	4	240	2:58	1560	49	2	6	52	9:43	2348	105
1	4	241	2:59	1560	210	2	6	53	9:45	2363	50
1	4	242	3:00	1710	145	2	6	54	9:45	2433	151
1	4	243	3:04	1565	215	2	6	55	9:48	2400	108
1	5	1	8:30	120	120	2	6	56	9:54	2112	135
1	5	2	8:30	240	22	2	6	57	9:57	2100	57
1	5	3	8:30	338	96	2	6	58	9:59	2040	110
1	5	4	8:30	362	153	2	6	59	10:05	1750	98
1	5	5	8:30	569	32	2	6	60	10:06	1832	108
1	5	6	8:30	840	120	2	6	61	10:10	1724	130
1	5	7	8:30	960	120	2	6	62	10:14	1594	65
1	5	8	8:32	720	30	2	6	63	10:15	1589	387
1	5	9	8:36	750	115	2	6	64	10:19	1682	176
1	5	10	8:38	755	95	2	6	65	10:21	1800	58
1	5	11	8:38	840	48	2	6	66	10:21	1802	353
1	5	12	8:40	732	59	2	6	67	10:24	2040	50
1	5	13	8:42	673	54	2	6	68	10:24	2050	85
1	5	14	8:43	679	43	2	6	69	10:29	1905	111
1	5	15	8:44	696	96	2	6	70	10:32	1800	44
1	5	16	8:47	600	167	2	6	71	10:32	1808	62
1	5	17	8:53	480	76	2	6	72	10:35	1686	835
1	5	18	8:54	524	132	2	6	73	10:37	2411	108
1	5	19	8:57	452	70	2	6	74	10:37	2063	100
1	5	20	9:03	180	66	2	6	75	10:39	2563	579
1	5	21	9:05	774	82	2	6	76	10:43	2824	550
1	5	22	9:06	752	55	2	6	77	10:44	3360	44
1	5	23	9:07	720	37	2	6	78	10:45	3310	46
1	5	24	9:09	660	157	2	6	79	10:47	3264	123
1	5	25	9:10	743	248	2	6	80	10:48	3321	100
1	5	26	9:11	915	116	2	6	81	10:48	3461	42
1	5	27	9:13	919	24	2	6	82	10:50	3360	58
1	5	28	9:14	955	112	2	6	83	10:54	3160	117

1	5	29	9:15	903	42	2	6	84	10:54	3243	62
1	5	30	9:16	921	67	2	6	85	10:54	3360	88
1	5	31	9:19	794	66	2	6	86	10:55	3392	79
1	5	32	9:20	788	62	2	6	87	10:56	3373	227
1	5	33	9:23	666	109	2	6	88	10:57	3566	68
1	5	34	9:24	737	57	2	6	89	10:58	3438	114
1	5	35	9:24	800	124	2	6	90	11:03	3084	476
1	5	36	9:26	796	65	2	6	91	11:03	3568	94
1	5	37	9:27	791	62	2	6	92	11:04	3600	44
1	5	38	9:28	840	101	2	6	93	11:06	3490	48
1	5	39	9:28	979	79	2	6	94	11:06	3562	158
1	5	40	9:37	540	105	2	6	95	11:09	3584	245
1	5	41	9:40	435	162	2	6	96	11:17	3339	140
1	5	42	9:48	153	213	2	6	97	11:19	3319	80
1	5	43	9:57	660	92	2	6	98	11:21	3300	58
1	5	44	10:00	568	126	2	6	99	11:22	3241	37
1	5	45	10:01	622	394	2	6	100	11:25	3142	130
1	5	46	10:02	900	48	2	6	101	11:29	3012	69
1	5	47	10:03	900	80	2	6	102	11:29	3063	94
1	5	48	10:06	780	40	2	6	103	11:30	3149	72
1	5	49	10:07	780	99	2	6	104	11:30	3197	68
1	5	50	10:08	801	58	2	6	105	11:32	3129	46
1	5	51	10:09	803	55	2	6	106	11:51	2063	176
1	5	52	10:11	748	69	2	6	107	12:06	3420	93
1	5	53	10:12	739	139	2	6	108	12:09	3327	330
1	5	54	10:14	780	79	2	6	109	12:10	3657	204
1	5	55	10:15	821	101	2	6	110	12:11	3753	256
1	5	56	10:20	540	43	2	6	111	12:13	3857	74
1	5	57	10:20	557	64	2	6	112	12:14	3843	83
1	5	58	10:21	553	122	2	6	113	12:15	3940	144
1	5	59	10:23	551	20	2	6	114	12:15	4036	37
1	5	60	10:24	591	140	2	6	115	12:15	4119	196
1	5	61	10:26	571	79	2	6	116	12:15	4380	67
1	5	62	10:26	612	45	2	6	117	12:16	4433	94
1	5	63	10:30	447	134	2	6	118	12:19	4279	105
1	5	64	10:31	493	99	2	6	119	12:21	4294	71
1	5	65	10:33	514	189	2	6	120	12:21	4343	141
1	5	66	10:36	480	60	2	6	121	12:21	4560	91
1	5	67	10:42	180	60	2	6	122	12:24	4049	129
1	5	68	10:43	130	54	2	6	123	12:25	4400	62
1	5	69	10:44	136	38	2	6	124	12:27	4338	39
1	5	70	10:45	180	70	2	6	125	12:29	4299	157

1	5	71	10:46	230	96	2	6	126	12:31	4262	43
1	5	72	10:46	254	128	2	6	127	12:34	4159	106
1	5	73	10:49	186	241	2	6	128	12:36	4173	96
1	5	74	10:50	365	169	2	6	129	12:40	4020	54
1	5	75	10:55	272	244	2	6	130	12:40	4023	96
1	5	76	10:57	372	62	2	6	131	12:41	5427	276
1	5	77	10:59	310	111	2	6	132	12:41	4440	60
1	5	78	11:00	379	101	2	6	133	12:41	4500	588
1	5	79	11:02	398	183	2	6	134	12:47	4692	583
1	5	80	11:05	395	185	2	6	135	1:16	3840	94
1	5	81	11:06	510	30	2	6	136	1:18	3806	97
1	5	82	11:07	480	37	2	6	137	1:25	3529	75
1	5	83	11:10	313	28	2	6	138	1:36	3000	336
1	5	84	11:11	345	525	2	6	139	1:36	3324	40
1	5	85	11:13	720	84	2	6	140	1:39	3224	130
1	5	86	11:18	516	46	2	6	141	1:40	3274	125
1	5	87	11:18	590	101	2	6	142	1:55	2489	49
1	5	88	11:21	429	62	2	6	143	2:01	2160	38
1	5	89	11:25	247	109	2	6	144	2:06	1862	83
1	5	90	11:28	198	103	2	6	145	2:10	1779	75
1	5	91	11:29	245	20	2	6	146	2:16	1464	75
1	5	92	11:30	195	49	2	6	147	2:18	1389	30
1	5	93	11:31	206	146	2	6	148	2:22	1239	93
1	5	94	11:32	300	210	2	6	149	2:23	2040	59
1	5	95	11:33	450	64	2	6	150	2:25	1980	60
1	5	96	11:34	446	113	2	6	151	2:41	1440	96
1	5	97	11:35	480	30	2	6	152	2:46	1224	193
1	5	98	11:37	423	21	2	6	153	2:47	1331	69
1	5	99	11:41	282	131	2	6	154	2:48	1322	88
1	5	100	11:43	271	112	2	6	155	2:52	1234	143
1	5	101	11:45	279	52	2	6	156	2:54	1211	167
1	5	102	11:46	287	147	2	6	157	2:58	1164	40
1	5	103	11:48	260	80	2	7	1	8:30	420	196
1	5	104	11:50	240	103	2	7	2	8:30	644	135
1	5	105	11:52	187	50	2	7	3	8:30	780	105
1	5	106	11:53	193	55	2	7	4	8:30	855	172
1	5	107	11:55	138	54	2	7	5	8:37	780	97
1	5	108	11:55	204	84	2	7	6	8:39	743	238
1	5	109	11:56	240	60	2	7	7	8:40	925	118
1	5	110	11:58	180	70	2	7	8	8:45	747	58
1	5	111	11:59	230	141	2	7	9	8:47	689	59
1	5	112	11:59	329	64	2	7	10	8:49	630	77

1	5	113	12:00	325	56	2	7	11	8:50	613	130
1	5	114	12:01	329	29	2	7	12	8:51	663	229
1	5	115	12:03	360	143	2	7	13	8:54	734	35
1	5	116	12:05	397	37	2	7	14	8:54	819	69
1	5	117	12:08	263	83	2	7	15	8:56	750	38
1	5	118	12:09	300	39	2	7	16	8:59	652	80
1	5	119	12:10	240	92	2	7	17	9:02	512	138
1	5	120	12:11	268	69	2	7	18	9:04	494	100
1	5	121	12:12	259	116	2	7	19	9:04	634	369
1	5	122	12:14	263	63	2	7	20	9:05	925	41
1	5	123	12:15	260	67	2	7	21	9:05	1004	90
1	5	124	12:16	253	87	2	7	22	9:08	854	44
1	5	125	12:16	406	56	2	7	23	9:09	870	56
1	5	126	12:19	290	65	2	7	24	9:11	814	194
1	5	127	12:21	285	154	2	7	25	9:11	980	54
1	5	128	12:23	251	96	2	7	26	9:11	1046	128
1	5	129	12:24	335	40	2	7	27	9:11	1158	41
1	5	130	12:29	120	60	2	7	28	9:13	1117	62
1	5	131	12:30	120	145	2	7	29	9:13	1200	100
1	5	132	12:30	275	86	2	7	30	9:15	1160	116
1	5	133	12:30	1740	180	2	7	31	9:17	1164	52
1	5	134	1:06	1380	171	2	7	32	9:18	1172	76
1	5	135	1:10	1269	148	2	7	33	9:19	976	307
1	5	136	1:12	1361	71	2	7	34	9:20	2460	150
1	5	137	1:16	1170	98	2	7	35	9:20	2610	91
1	5	138	1:18	1192	97	2	7	36	9:20	2700	59
1	5	139	1:19	1155	65	2	7	37	9:24	2520	60
1	5	140	1:21	1090	45	2	7	38	9:24	2580	46
1	5	141	1:23	1045	110	2	7	39	9:27	2414	108
1	5	142	1:25	1055	46	2	7	40	9:28	2486	42
1	5	143	1:26	469	131	2	7	41	9:29	2504	70
1	5	144	1:28	1020	89	2	7	42	9:31	2434	431
1	5	145	1:30	969	32	2	7	43	9:32	2783	39
1	5	146	1:32	937	136	2	7	44	9:32	2864	68
1	5	147	1:32	1041	41	2	7	45	9:32	2676	167
1	5	148	1:37	880	53	2	7	46	9:36	3109	148
1	5	149	1:40	720	30	2	7	47	9:36	2961	45
1	5	150	1:40	737	51	2	7	48	9:36	3036	48
1	5	151	1:42	686	35	2	7	49	9:38	3060	97
1	5	152	1:42	771	146	2	7	50	9:39	3083	231
1	5	153	1:49	445	176	2	7	51	9:41	3212	91
1	5	154	1:49	629	44	2	7	52	9:42	3240	73

1	5	155	1:49	705	91	2	7	53	9:42	3347	220
1	5	156	1:50	674	74	2	7	54	9:43	3427	321
1	5	157	1:51	720	60	2	7	55	9:43	3826	57
1	5	158	1:51	780	60	2	7	56	9:45	3769	102
1	5	159	1:53	720	114	2	7	57	9:46	3727	372
1	5	160	1:55	606	54	2	7	58	9:46	3840	55
1	5	161	1:55	672	132	2	7	59	9:46	4020	119
1	5	162	1:57	720	163	2	7	60	9:47	3960	271
1	5	163	1:59	737	27	2	7	61	9:47	4229	65
1	5	164	2:00	770	141	2	7	62	9:49	4164	94
1	5	165	2:02	744	209	2	7	63	9:50	4250	67
1	5	166	2:05	1260	420	2	7	64	9:50	4313	119
1	5	167	2:05	1800	147	2	7	65	9:56	4020	54
1	5	168	2:05	1953	313	2	7	66	9:58	3960	50
1	5	169	2:07	2120	97	2	7	67	10:01	3790	100
1	5	170	2:07	2263	91	2	7	68	10:02	3870	171
1	5	171	2:09	2172	59	2	7	69	10:05	3879	76
1	5	172	2:11	2113	104	2	7	70	10:08	3743	66
1	5	173	2:13	2129	109	2	7	71	10:11	3617	43
1	5	174	2:13	2260	43	2	7	72	10:13	3574	47
1	5	175	2:16	2154	62	2	7	73	10:14	3587	53
1	5	176	2:17	2100	55	2	7	74	10:14	3600	54
1	5	177	2:23	1800	70	2	7	75	10:14	3660	73
1	5	178	2:24	1800	50	2	7	76	10:15	3707	94
1	5	179	2:26	1740	91	2	7	77	10:17	3613	81
1	5	180	2:26	1829	137	2	7	78	10:23	3412	77
1	5	181	2:29	1752	235	2	7	79	10:23	3455	42
1	5	182	2:31	1877	30	2	7	80	10:32	2940	53
1	5	183	2:31	1967	154	2	7	81	10:36	2760	80
1	5	184	2:32	1993	43	2	7	82	10:36	2860	81
1	5	185	2:34	1950	364	2	7	83	10:38	2779	63
1	5	186	2:37	2100	159	2	7	84	10:38	2836	56
1	5	187	2:38	2181	56	2	7	85	10:39	2810	77
1	5	188	2:38	1045	196	2	7	86	10:41	2763	58
1	5	189	2:44	2049	88	2	7	87	10:45	2585	286
1	5	190	2:44	2160	49	2	7	88	10:46	2839	250
1	5	191	2:44	2220	51	2	7	89	10:47	3009	107
1	5	192	2:47	2049	47	2	7	90	10:48	3082	53
1	5	193	2:47	2122	71	2	7	91	10:49	3089	50
1	5	194	2:48	2111	171	2	7	92	10:50	3099	129
1	5	195	2:48	2300	40	2	7	93	10:50	3210	76
1	5	196	2:50	2260	280	2	7	94	10:52	3134	117

1	5	197	2:51	2460	120	2	7	95	10:53	3197	114
1	5	198	2:53	2460	97	2	7	96	11:01	2843	114
1	5	199	2:53	2543	120	2	7	97	11:03	2849	57
1	5	200	2:54	2723	121	2	7	98	11:03	2672	118
1	5	201	2:54	2842	82	2	7	99	11:10	2614	57
1	5	202	2:54	2940	60	2	7	100	11:10	2677	107
1	5	203	2:56	2880	110	2	7	101	11:16	2450	5
1	5	204	3:00	2710	47	2	7	102	11:17	2400	90
1	5	205	3:00	2783	113	2	7	103	11:17	2781	30
1	5	206	3:03	2730	165	2	7	104	11:26	2280	66
1	5	207	3:04	2865	66	2	7	105	11:26	2394	153
1	5	208	3:04	2919	74	2	7	106	11:28	3000	60
1	6	1	8:30	420	267	2	7	107	11:30	2940	157
1	6	2	8:30	693	523	2	7	108	11:32	2963	99
1	6	3	8:30	910	173	2	7	109	11:35	2924	92
1	6	4	8:30	1037	165	2	7	110	11:39	2712	265
1	6	5	8:30	1172	81	2	7	111	11:46	2627	83
1	6	6	8:30	1211	251	2	7	112	11:57	2374	110
1	6	7	8:30	1465	249	2	7	113	12:00	4380	86
1	6	8	8:30	1636	240	2	7	114	12:04	4414	72
1	6	9	8:30	1816	185	2	7	115	1:05	622	63
1	6	10	8:30	1931	182	2	7	116	1:07	559	162
1	6	11	8:30	2049	480	2	7	117	1:07	757	319
1	6	12	8:30	2469	232	2	7	118	1:11	798	212
1	6	13	8:30	2657	197	2	7	119	1:17	706	65
1	6	14	8:30	3025	64	2	7	120	1:21	521	26
1	6	15	8:30	3081	309	2	7	121	1:22	525	151
1	6	16	8:35	3012	60	2	7	122	1:24	494	350
1	6	17	8:35	3072	285	2	7	123	1:24	864	75
1	6	18	8:35	3327	207	2	7	124	1:24	909	55
1	6	19	8:35	3667	67	2	7	125	1:30	614	40
1	6	20	8:40	3974	284	2	7	126	1:30	694	127
1	6	21	8:41	4170	364	2	7	127	1:30	1020	111
1	6	22	8:42	4406	199	2	7	128	1:30	1089	102
1	6	23	8:44	4387	148	2	7	129	1:31	1167	223
1	6	24	8:45	4479	90	2	7	130	1:32	1364	85
1	6	25	8:59	3669	153	2	7	131	1:36	1860	77
1	6	26	8:59	3756	186	2	7	132	1:40	1680	43
1	6	27	8:59	3930	65	2	7	133	1:44	2100	76
1	6	28	9:00	3925	166	2	7	134	1:52	1724	194
1	6	29	9:00	4059	190	2	7	135	1:52	1890	103
1	6	30	9:02	4049	34	2	7	136	1:54	1980	76

1	6	31	9:05	3955	265	2	7	137	1:58	1920	151
1	6	32	9:10	3780	30	2	7	138	2:02	1829	100
1	6	33	9:10	3840	44	2	7	139	2:04	1849	75
1	6	34	9:10	3916	48	2	7	140	2:10	1920	99
1	6	35	9:15	3688	193	2	7	141	2:13	1860	96
1	6	36	9:15	3795	55	2	7	142	2:15	1824	75
1	6	37	9:17	3740	35	2	7	143	2:17	1860	112
1	6	38	9:18	3765	176	2	7	144	2:19	1860	147
1	6	39	9:27	3324	231	2	7	145	2:19	2013	43
1	6	40	9:29	3360	30	2	7	146	2:20	2030	52
1	6	41	9:29	3390	40	2	7	147	2:29	1500	58
1	6	42	9:29	3470	271	2	7	148	2:35	1200	122
1	6	43	9:33	3371	54	2	7	149	2:37	1200	58
1	6	44	9:33	3437	167	2	7	150	2:38	1200	125
1	6	45	9:35	3450	202	2	7	151	2:40	1255	252
1	6	46	9:35	3548	353	2	7	152	2:46	1123	291
1	6	47	9:36	3795	63	2	7	153	2:50	1320	193
1	6	48	9:40	3612	63	2	7	154	2:50	1560	81
1	6	49	9:42	3549	64	2	7	155	2:56	1299	84
1	6	50	9:44	3540	313	2	7	156	2:58	1210	68
1	6	51	9:44	3869	313	2	7	157	3:00	1200	83
1	6	52	9:46	3976	356	2	7	158	3:01	1237	55
1	6	53	9:47	4220	25	2	8	1	8:30	120	36
1	6	54	9:53	3900	55	2	8	2	8:30	180	101
1	6	55	9:54	3900	156	2	8	3	8:30	259	40
1	6	56	9:55	3984	65	2	8	4	8:30	339	48
1	6	57	9:56	3979	144	2	8	5	8:30	411	61
1	6	58	9:57	4020	49	2	8	6	8:30	420	44
1	6	59	9:58	3966	186	2	8	7	8:30	426	32
1	6	60	10:04	3840	124	2	8	8	8:30	514	85
1	6	61	10:07	3834	86	2	8	9	8:30	549	145
1	6	62	10:07	3868	40	2	8	10	8:30	764	91
1	6	63	10:08	3853	199	2	8	11	8:32	673	49
1	6	64	10:08	4074	103	2	8	12	8:36	504	215
1	6	65	10:12	3851	44	2	8	13	8:36	769	65
1	6	66	10:15	3747	315	2	8	14	8:36	780	34
1	6	67	10:21	3612	432	2	8	15	8:41	490	86
1	6	68	10:27	3840	90	2	8	16	8:44	464	130
1	6	69	10:28	3870	312	2	8	17	8:45	514	131
1	6	70	10:31	3908	56	2	8	18	8:54	83	134
1	6	71	10:34	3792	132	2	8	19	8:55	129	806
1	6	72	10:36	3830	215	2	8	20	8:56	943	211

1	6	73	10:42	3555	243	2	8	21	8:59	912	47
1	6	74	10:42	3732	66	2	8	22	9:00	925	237
1	6	75	10:52	3186	66	2	8	23	9:01	1108	185
1	6	76	10:53	3240	53	2	8	24	9:01	1283	39
1	6	77	10:54	3187	156	2	8	25	9:01	1320	44
1	6	78	11:03	2791	353	2	8	26	9:02	1320	256
1	6	79	11:07	2858	278	2	8	27	9:14	884	95
1	6	80	11:08	3120	60	2	8	28	9:14	909	56
1	6	81	11:11	3060	60	2	8	29	9:15	913	39
1	6	82	11:11	3371	348	2	8	30	9:15	994	91
1	6	83	11:18	3263	359	2	8	31	9:19	900	81
1	6	84	11:33	2664	264	2	8	32	9:22	819	68
1	6	85	11:34	2880	240	2	8	33	9:24	1440	91
1	6	86	11:39	2880	60	2	8	34	9:25	2040	339
1	6	87	11:43	2700	41	2	8	35	9:34	1821	62
1	6	88	11:44	2659	79	2	8	36	9:35	1819	48
1	6	89	11:44	2760	42	2	8	37	9:38	1711	41
1	6	90	11:47	2658	198	2	8	38	9:40	1620	49
1	6	91	11:48	2820	238	2	8	39	9:44	1381	178
1	6	92	11:48	3122	273	2	8	40	9:45	1503	140
1	6	93	11:49	3329	136	2	8	41	9:46	1663	160
1	6	94	11:54	3073	88	2	8	42	9:46	1743	97
1	6	95	11:54	3165	231	2	8	43	9:46	1886	129
1	6	96	11:55	3294	112	2	8	44	9:51	1740	69
1	6	97	11:58	3122	182	2	8	45	9:52	1791	227
1	6	98	11:58	3360	49	2	8	46	10:03	1264	51
1	6	99	12:04	3011	54	2	8	47	10:03	1333	23
1	6	100	12:04	3072	72	2	8	48	10:05	1310	270
1	6	101	12:05	3060	600	2	8	49	10:06	1500	143
1	6	102	12:05	3900	47	2	8	50	10:08	1537	143
1	6	103	12:06	3900	300	2	8	51	10:12	1440	86
1	6	104	12:16	4440	300	2	8	52	10:16	1294	125
1	6	105	12:36	5220	225	2	8	53	10:20	1169	130
1	6	106	12:40	5115	25	2	8	54	10:20	1279	97
1	6	107	12:41	5100	50	2	8	55	10:22	1302	53
1	6	108	12:41	5160	74	2	8	56	10:24	1249	78
1	6	109	12:47	4906	54	2	8	57	10:24	1291	63
1	6	110	12:48	4912	58	2	8	58	10:27	1168	107
1	6	111	12:48	4974	238	2	8	59	10:28	1241	48
1	6	112	12:50	5036	947	2	8	60	10:35	893	150
1	6	113	12:51	5002	202	2	8	61	10:36	923	42
1	6	114	12:58	4800	102	2	8	62	10:38	960	119

1	6	115	12:59	4818	18	2	8	63	10:39	1020	101
1	6	116	1:00	4800	60	2	8	64	10:46	679	119
1	6	117	1:04	4620	75	2	8	65	10:49	620	321
1	6	118	1:16	3405	165	2	8	66	10:53	720	59
1	6	119	1:26	3480	174	2	8	67	10:53	780	423
1	6	120	1:37	2966	56	2	8	68	10:55	1137	300
1	6	121	1:40	2850	90	2	8	69	10:57	1260	46
1	6	122	1:49	2400	300	2	8	70	11:03	911	125
1	6	123	1:59	2400	49	2	8	71	11:03	1026	47
1	6	124	2:10	1751	71	2	8	72	11:04	1039	93
1	6	125	2:16	1500	49	2	8	73	11:05	1126	51
1	6	126	2:17	1451	210	2	8	74	11:08	1015	267
1	6	127	2:20	1481	161	2	8	75	11:09	1288	146
1	6	128	2:20	1620	98	2	8	76	11:17	782	35
1	6	129	2:28	1222	77	2	8	77	11:21	627	224
1	6	130	2:29	1205	344	2	8	78	11:21	840	182
1	6	131	2:29	1521	286	2	8	79	11:21	1020	58
1	6	132	2:30	1715	88	2	8	80	11:28	660	92
1	6	133	2:31	1687	119	2	8	81	11:31	568	170
1	6	134	2:32	1688	171	2	8	82	11:36	458	61
1	6	135	2:34	1697	77	2	8	83	11:36	517	70
1	6	136	2:35	1740	99	2	8	84	11:38	447	92
1	6	137	2:41	1440	12	2	8	85	11:38	595	202
1	6	138	2:42	1440	60	2	8	86	11:38	753	51
1	6	139	2:44	1380	120	2	8	87	11:52	0	235
1	6	140	2:45	1500	43	2	8	88	11:55	0	36
1	6	141	2:51	1157	317	2	8	89	11:57	0	64
1	6	142	2:54	1320	60	2	8	90	12:00	180	107
1	7	1	8:30	130	205	2	8	91	12:01	193	139
1	7	2	8:30	635	507	2	8	92	12:04	234	115
1	7	3	8:30	1028	178	2	8	93	12:05	299	152
1	7	4	8:30	1150	217	2	8	94	12:06	327	103
1	7	5	8:30	1353	46	2	8	95	12:08	344	201
1	7	6	8:30	1427	201	2	8	96	12:12	263	336
1	7	7	8:30	1526	73	2	8	97	12:16	407	194
1	7	8	8:30	1573	143	2	8	98	12:25	0	82
1	7	9	8:30	1680	42	2	8	99	12:27	0	113
1	7	10	8:30	1688	140	2	8	100	12:27	120	153
1	7	11	8:30	1848	95	2	8	101	12:29	147	786
1	7	12	8:30	1873	193	2	8	102	12:30	861	92
1	7	13	8:30	2044	151	2	8	103	12:37	589	70
1	7	14	8:30	2193	253	2	8	104	12:39	519	68

1	7	15	8:30	2360	155	2	8	105	12:42	391	109
1	7	16	8:30	2505	55	2	8	106	1:37	0	321
1	7	17	8:30	2570	60	2	8	107	1:37	339	139
1	7	18	8:30	2595	305	2	8	108	1:43	71	29
1	7	19	8:30	2830	59	2	8	109	1:45	60	133
1	7	20	8:30	2891	356	2	8	110	1:47	120	551
1	7	21	8:30	3195	225	2	9	1	8:30	0	71
1	7	22	8:30	3390	45	2	9	2	8:30	109	91
1	7	23	8:30	3465	92	2	9	3	8:30	198	39
1	7	24	8:30	3493	61	2	9	4	8:30	201	158
1	7	25	8:30	3552	56	2	9	5	8:36	240	97
1	7	26	8:30	3616	146	2	9	6	8:39	143	40
1	7	27	8:30	3729	59	2	9	7	8:41	240	272
1	7	28	8:45	2890	54	2	9	8	8:42	448	424
1	7	29	8:45	2956	51	2	9	9	8:47	564	71
1	7	30	8:45	3025	75	2	9	10	8:50	433	49
1	7	31	8:48	2890	170	2	9	11	8:51	444	35
1	7	32	8:48	3020	65	2	9	12	8:55	240	49
1	7	33	8:49	3015	555	2	9	13	8:58	120	57
1	7	34	8:51	3720	60	2	9	14	8:58	123	104
1	7	35	8:52	3900	180	2	9	15	8:59	619	99
1	7	36	8:53	4080	60	2	9	16	9:00	700	59
1	7	37	8:56	3993	38	2	9	17	9:01	701	126
1	7	38	8:56	4020	55	2	9	18	9:03	1560	60
1	7	39	8:58	3905	175	2	9	19	9:04	1520	119
1	7	40	8:58	4030	160	2	9	20	9:05	1581	39
1	7	41	9:00	4050	150	2	9	21	9:06	1602	53
1	7	42	9:01	4200	57	2	9	22	9:06	1669	126
1	7	43	9:02	4143	46	2	9	23	9:08	1663	138
1	7	44	9:02	4337	57	2	9	24	9:08	1765	40
1	7	45	9:04	4280	190	2	9	25	9:09	1785	71
1	7	46	9:05	4330	55	2	9	26	9:10	1774	35
1	7	47	9:11	4035	70	2	9	27	9:16	1499	78
1	7	48	9:13	3965	141	2	9	28	9:19	1361	98
1	7	49	9:20	3660	44	2	9	29	9:20	1323	34
1	7	50	9:21	3660	20	2	9	30	9:25	1109	210
1	7	51	9:21	3700	250	2	9	31	9:29	1080	59
1	7	52	9:21	3870	40	2	9	32	9:31	1020	60
1	7	53	9:22	4020	490	2	9	33	9:32	1020	100
1	7	54	9:22	4520	49	2	9	34	9:35	920	118
1	7	55	9:22	4591	42	2	9	35	9:36	982	62
1	7	56	9:23	4609	79	2	9	36	9:45	1260	65

1	7	57	9:25	4530	469	2	9	37	9:50	1075	176
1	7	58	9:27	4661	388	2	9	38	9:53	1079	135
1	7	59	9:30	4933	43	2	9	39	9:53	1184	73
1	7	60	9:33	4830	155	2	9	40	9:53	1231	131
1	7	61	9:34	4920	45	2	9	41	9:53	1339	66
1	7	62	9:36	4870	55	2	9	42	9:54	1333	149
1	7	63	9:46	4215	280	2	9	43	9:58	1304	122
1	7	64	9:46	4475	245	2	9	44	10:02	1182	184
1	7	65	9:48	4530	210	2	9	45	10:04	1238	74
1	7	66	9:48	4860	90	2	9	46	10:08	1044	45
1	7	67	9:56	4470	50	2	9	47	10:14	759	72
1	7	68	9:57	4480	50	2	9	48	10:15	747	68
1	7	69	9:58	4440	60	2	9	49	10:17	679	55
1	7	70	10:01	4320	214	2	9	50	10:23	384	71
1	7	71	10:02	4466	86	2	9	51	10:24	373	102
1	7	72	10:03	4740	80	2	9	52	10:24	511	242
1	7	73	10:05	4720	320	2	9	53	10:25	720	385
1	7	74	10:05	4940	170	2	9	54	10:27	1620	87
1	7	75	10:06	5010	90	2	9	55	10:31	1473	55
1	7	76	10:06	5100	280	2	9	56	10:33	1380	38
1	7	77	10:06	5360	239	2	9	57	10:34	1380	56
1	7	78	10:07	5481	62	2	9	58	10:44	784	572
1	7	79	10:13	5179	79	2	9	59	10:53	872	179
1	7	80	10:16	5100	101	2	9	60	10:55	933	349
1	7	81	10:16	5179	53	2	9	61	10:55	1260	44
1	7	82	10:19	5066	68	2	9	62	10:56	1260	81
1	7	83	10:33	4278	61	2	9	63	10:57	1299	58
1	7	84	10:40	3917	317	2	9	64	11:09	621	44
1	7	85	10:49	3720	289	2	9	65	11:13	457	292
1	7	86	10:49	2831	181	2	9	66	11:15	645	65
1	7	87	11:08	2830	231	2	9	67	11:22	240	40
1	7	88	11:10	3079	167	2	9	68	11:22	300	43
1	7	89	11:10	2792	515	2	9	69	11:26	77	379
1	7	90	11:17	2729	68	2	9	70	11:32	120	58
1	7	91	11:26	2781	67	2	9	71	11:33	120	131
1	7	92	11:27	2774	237	2	9	72	11:33	289	75
1	7	93	11:30	2777	123	2	9	73	11:34	274	45
1	7	94	11:39	2354	260	2	9	74	11:36	180	49
1	7	95	11:46	2220	54	2	9	75	11:37	180	167
1	7	96	11:47	2220	155	2	9	76	11:38	253	68
1	7	97	11:51	2115	234	2	9	77	11:39	245	66
1	7	98	11:55	2121	31	2	9	78	11:39	360	59

1	7	99	12:05	1560	30	2	9	79	11:41	300	36
1	7	100	12:08	1400	66	2	9	80	11:42	264	41
1	7	101	12:08	1444	210	2	9	81	11:45	163	86
1	7	102	12:08	1714	41	2	9	82	11:48	0	181
1	7	103	12:27	653	87	2	9	83	11:50	76	232
1	7	104	12:29	566	42	2	9	84	11:51	264	50
1	7	105	12:33	404	251	2	9	85	11:52	274	45
1	7	106	12:34	573	33	2	9	86	10:53*	3889	126
1	7	107	12:38	327	173	2	9	87	10:53*	4003	49
1	7	108	12:40	310	113	2	9	88	12:00	54	197
1	7	109	12:41	377	97	2	9	89	10:36*	5160	44
1	7	110	12:42	460	100	2	9	90	10:37*	5160	133
1	7	111	12:44	420	207	2	9	91	12:04	107	75
1	7	112	12:46	513	333	2	9	92	12:04	180	99
1	7	113	12:48	720	120	2	9	93	12:05	201	50
1	7	114	12:52	660	222	2	9	94	12:05	271	88
1	7	115	12:53	780	198	2	9	95	12:07	360	158
1	7	116	12:54	900	109	2	9	96	12:013	144	68
1	7	117	12:55	900	156	2	9	97	12:16	0	50
1	7	118	12:57	900	30	2	9	98	12:17	0	65
1	7	119	12:57	910	130	2	9	99	12:18	0	116
1	7	120	12:58	1020	103	2	9	100	12:21	0	177
1	7	121	1:00	337	257	2	9	101	12:22	63	35
1	7	122	1:44	360	112	2	9	102	12:22	148	62
1	7	123	1:44	428	161	2	9	103	12:22	206	116
1	7	124	1:44	567	65	2	9	104	12:22	330	43
1	7	125	1:45	562	33	2	9	105	12:22	407	155
1	7	126	1:47	529	226	2	9	106	12:29	72	108
1	7	127	1:47	603	363	2	9	107	12:31	84	92
1	7	128	1:48	960	328	2	9	108	12:32	180	216
1	7	129	1:52	1052	212	2	9	109	12:33	324	280
1	7	130	1:52	1260	60	2	9	110	12:35	480	44
1	7	131	1:55	1200	97	2	9	111	12:36	540	244
1	7	132	2:00	983	383	2	9	112	12:36	780	56
1	7	133	2:01	1620	120	2	9	113	12:46	182	38
1	7	134	2:01	1920	136	2	9	114	12:49	84	84
1	7	135	2:04	1844	266	2	9	115	12:49	180	54
1	7	136	2:08	1758	160	2	9	116	12:52	0	62
1	7	137	2:09	1838	948	2	9	117	1:25	300	60
1	7	138	2:14	3050	76	2	9	118	1:31	0	80
1	7	139	2:25	2434	74	2	9	119	1:32	40	40
1	7	140	2:28	2300	231	2	9	120	1:33	0	87

1	7	141	2:32	2249	155	2	9	121	1:35	0	94
1	7	142	2:39	1974	39	2	9	122	1:35	60	73
1	7	143	2:41	1821	28	2	9	123	1:38	0	100
1	7	144	2:45	1673	20	2	9	124	1:38	120	99
1	7	145	2:49	1400	890	2	9	125	1:39	141	41
1	7	146	2:50	1470	163	2	9	126	1:44	40	78
1	7	147	2:56	1547	78	2	9	127	1:45	22	147
1	7	148	3:02	1229	80	2	9	128	1:48	0	55
1	8	1	8:30	305	122	2	9	129	1:50	0	51
1	8	2	8:30	423	123	2	9	130	1:50	0	55
1	8	3	8:30	600	93	2	9	131	1:51	0	70
1	8	4	8:30	87	178	2	9	132	1:52	1080	552
1	8	5	8:30	809	44	2	9	133	1:54	1548	164
1	8	6	8:30	885	202	2	9	134	1:54	1624	170
1	8	7	8:30	983	174	2	9	135	1:57	1620	46
1	8	8	8:30	1109	49	2	9	136	2:08	968	37
1	8	9	8:30	1180	128	2	9	137	2:09	985	55
1	8	10	8:30	1292	142	2	9	138	2:11	934	47
1	8	11	8:30	1390	151	2	9	139	2:12	947	90
1	8	12	8:30	1599	68	2	9	140	2:12	977	40
1	8	13	8:30	1651	151	2	9	141	2:14	937	56
1	8	14	8:30	1815	111	2	9	142	2:15	941	82
1	8	15	8:30	1980	80	2	9	143	2:16	919	65
1	8	16	8:30	2100	40	2	9	144	2:16	960	136
1	8	17	8:30	2160	111	2	9	145	2:18	1020	60
1	8	18	8:30	2229	189	2	9	146	2:19	1080	83
1	8	19	8:30	2460	156	2	9	147	2:22	960	150
1	8	20	8:30	2604	314	2	9	148	2:26	840	78
1	8	21	8:30	4870	85	2	9	149	2:26	960	87
1	8	22	8:30	3045	101	2	9	150	2:28	933	68
1	8	23	8:30	3064	244	2	9	151	2:29	925	131
1	8	24	8:30	3600	47	2	9	152	2:31	914	87
1	8	25	8:35	3406	344	2	9	153	2:35	827	96
1	8	26	8:40	3362	62	2	9	154	2:35	851	378
1	8	27	8:42	3360	115	2	9	155	2:36	900	46
1	8	28	8:44	3365	125	2	9	156	2:45	367	88
1	8	29	8:44	3480	97	2	9	157	2:48	339	135
1	8	30	8:45	3503	95	2	9	158	2:50	360	89
1	8	31	8:45	3767	107	2	9	159	2:57	120	261
1	8	32	8:48	4030	61	2	9	160	3:01	159	58
1	8	33	8:48	4089	89	2	9	161	3:02	151	468
1	8	34	8:48	4250	139	2	10	1	8:30	780	157

1	8	35	8:50	4231	132	2	10	2	8:30	983	25
1	8	36	8:55	4039	319	2	10	3	8:30	1020	32
1	8	37	8:59	4140	360	2	10	4	8:30	1036	33
1	8	38	9:04	4260	213	2	10	5	8:30	1123	64
1	8	39	9:05	4467	70	2	10	6	8:30	1179	75
1	8	40	9:05	4517	73	2	10	7	8:30	1224	39
1	8	41	9:06	4504	79	2	10	8	8:30	1260	50
1	8	42	9:08	4500	45	2	10	9	8:30	1270	73
1	8	43	9:09	4500	106	2	10	10	8:30	1437	148
1	8	44	9:10	4514	94	2	10	11	8:30	1560	87
1	8	45	9:11	4600	220	2	10	12	8:30	1653	124
1	8	46	9:12	4740	103	2	10	13	8:38	1320	616
1	8	47	9:12	4877	117	2	10	14	8:38	2024	95
1	8	48	9:13	4880	53	2	10	15	8:41	1839	115
1	8	49	9:16	4767	48	2	10	16	8:43	1874	95
1	8	50	9:16	4839	110	2	10	17	8:44	1959	56
1	8	51	9:16	4969	80	2	10	18	8:45	1963	49
1	8	52	9:17	4949	107	2	10	19	8:49	1740	51
1	8	53	9:23	4680	31	2	10	20	8:52	1563	82
1	8	54	9:25	4570	212	2	10	21	8:53	1620	107
1	8	55	9:25	4838	50	2	10	22	8:55	1573	94
1	8	56	9:25	4908	53	2	10	23	8:56	1659	72
1	8	57	9:26	4915	133	2	10	24	8:57	1647	38
1	8	58	9:27	4962	42	2	10	25	8:58	1669	620
1	8	59	9:27	4980	60	2	10	26	9:01	2069	59
1	8	60	9:30	4920	96	2	10	27	9:04	2040	209
1	8	61	9:38	4524	283	2	10	28	9:08	1980	63
1	8	62	9:38	4841	401	2	10	29	9:09	1980	130
1	8	63	9:43	4920	104	2	10	30	9:10	2058	120
1	8	64	9:45	4876	231	2	10	31	9:14	3000	98
1	8	65	9:45	5125	290	2	10	32	9:14	3082	63
1	8	66	9:48	5255	283	2	10	33	9:16	3019	68
1	8	67	9:55	5152	73	2	10	34	9:16	3180	157
1	8	68	9:55	5199	409	2	10	35	9:16	3323	69
1	8	69	9:58	5450	59	2	10	36	9:19	3194	165
1	8	70	10:01	5331	165	2	10	37	9:21	3269	236
1	8	71	10:02	5406	121	2	10	38	9:21	3513	62
1	8	72	10:02	5465	154	2	10	39	9:26	3480	100
1	8	73	10:05	5671	238	2	10	40	9:31	3300	200
1	8	74	10:06	5733	61	2	10	41	9:31	3520	94
1	8	75	10:16	5129	176	2	10	42	9:33	3420	179
1	8	76	10:16	5313	358	2	10	43	9:44	3840	199

1	8	77	10:25	5675	376	2	10	44	9:47	3881	62
1	8	78	10:26	5479	139	2	10	45	9:49	3780	155
1	8	79	10:34	5580	228	2	10	46	9:51	3900	155
1	8	80	10:37	5292	192	2	10	47	9:53	3925	71
1	8	81	10:40	5340	108	2	10	48	9:58	3674	84
1	8	82	10:52	5232	42	2	10	49	9:59	3770	107
1	8	83	10:57	4590	368	2	10	50	9:59	3783	50
1	8	84	11:03	4642	142	2	10	51	10:00	3793	42
1	8	85	11:06	4440	86	2	10	52	10:04	3840	163
1	8	86	12:12	4354	79	2	10	53	10:04	3977	98
1	8	87	12:45	535	195	2	10	54	10:06	3999	93
1	8	88	12:49	240	141	2	10	55	10:06	4086	37
1	8	89	12:49	159	77	2	10	56	10:09	3929	64
1	8	90	12:51	82	63	2	10	57	10:10	3925	48
1	8	91	12:51	139	79	2	10	58	10:10	3997	76
1	8	92	12:57	240	75	2	10	59	10:13	3861	58
1	8	93	12:58	240	30	2	10	60	10:13	3923	44
1	8	94	12:58	445	45	2	10	61	10:14	3939	55
1	8	95	1:00	200	74	2	10	62	10:14	4020	130
1	8	96	1:03	66	66	2	10	63	10:15	4130	50
1	8	97	1:04	180	140	2	10	64	10:57	1620	150
1	8	98	1:06	160	50	2	10	65	10:57	1770	296
1	8	99	1:06	230	141	2	10	66	10:58	2014	129
1	8	100	1:07	209	132	2	10	67	10:59	2065	85
1	8	101	1:07	257	58	2	10	68	10:59	2160	321
1	8	102	1:08	259	126	2	10	69	10:59	2499	110
1	8	103	1:09	307	57	2	10	70	11:00	2569	135
1	8	104	1:12	190	40	2	10	71	11:01	2580	30
1	8	105	1:13	252	89	2	10	72	11:01	2584	45
1	8	106	1:17	120	31	2	10	73	11:02	2600	56
1	8	107	1:17	132	55	2	10	74	11:06	2424	73
1	8	108	1:19	77	36	2	10	75	11:10	2220	120
1	8	109	1:21	60	79	2	10	76	11:13	2160	157
1	8	110	1:22	101	136	2	10	77	11:14	2340	86
1	8	111	1:23	145	127	2	10	78	11:18	2160	135
1	8	112	1:24	198	78	2	10	79	11:22	2040	71
1	8	113	1:29	0	88	2	10	80	11:25	1920	76
1	8	114	1:30	92	191	2	10	81	11:26	1920	44
1	8	115	1:32	741	81	2	10	82	11:26	1980	58
1	8	116	1:37	0	60	2	10	83	11:32	1680	326
1	8	117	1:37	1440	540	2	10	84	11:34	1860	141
1	9	1	8:30	502	125	2	10	85	11:42	1539	84

1	9	2	8:30	617	110	2	10	86	11:46	1335	55
1	9	3	8:30	747	202	2	10	87	11:47	1340	49
1	9	4	8:30	905	114	2	10	88	11:49	1291	57
1	9	5	8:30	1031	131	2	10	89	11:50	1294	76
1	9	6	8:30	1200	48	2	10	90	11:54	1098	33
1	9	7	8:30	1212	132	2	10	91	11:56	1020	40
1	9	8	8:30	1380	111	2	10	92	12:10	185	154
1	9	9	8:30	1449	154	2	10	93	12:13	211	104
1	9	10	8:30	1655	83	2	10	94	12:14	780	150
1	9	11	8:30	1692	77	2	10	95	1:05	420	83
1	9	12	8:30	1855	125	2	10	96	1:06	457	71
1	9	13	8:30	1970	59	2	10	97	1:11	201	184
1	9	14	8:30	2013	63	2	10	98	1:24	197	148
1	9	15	8:30	2088	288	2	10	99	1:24	409	85
1	9	16	8:30	2325	136	2	10	100	1:24	564	41
1	9	17	8:30	2429	39	2	10	101	1:26	403	64
1	9	18	8:32	2520	346	2	10	102	1:28	339	72
1	9	19	8:33	2714	108	2	10	103	1:32	147	257
1	9	20	8:36	2666	62	2	10	104	1:32	370	127
1	9	21	8:39	2544	136	2	10	105	1:35	303	56
1	9	22	8:40	2588	210	2	10	106	1:35	367	138
1	9	23	8:43	2678	53	2	10	107	1:36	480	43
1	9	24	8:43	2745	255	2	10	108	1:38	366	83
1	9	25	8:43	2970	330	2	10	109	1:38	523	70
1	9	26	8:43	3300	190	2	10	110	1:40	453	134
1	9	27	8:45	3420	360	2	10	111	1:42	439	287
1	9	28	8:45	4566	186	2	10	112	1:55	300	70
1	9	29	8:47	4746	206	2	10	113	1:59	170	50
1	9	30	8:48	4960	204	2	10	114	1:59	180	50
1	9	31	8:48	5116	41	2	10	115	2:00	130	83
1	9	32	8:52	4955	126	2	10	116	2:00	287	200
1	9	33	8:53	5009	255	2	10	117	2:08	0	121
1	9	34	8:53	5234	53	2	10	118	2:08	173	53
1	9	35	8:54	5241	58	2	10	119	2:08	126	125
1	9	36	8:55	5246	168	2	10	120	2:10	180	57
1	9	37	8:55	5435	175	2	10	121	2:11	123	94
1	9	38	8:56	5624	88	2	10	122	2:12	209	380
1	9	39	8:57	5596	160	2	10	123	2:24	0	165
1	9	40	8:58	5736	138	2	10	124	2:27	0	223
1	9	41	9:03	5898	41	2	10	125	2:30	120	76
1	9	42	9:03	5977	192	2	10	126	2:31	120	40
1	9	43	9:04	6205	78	2	10	127	2:31	184	31

1	9	44	9:05	6707	56	2	10	128	2:35	33	65
1	9	45	9:05	6371	238	2	10	129	2:39	0	216
1	9	46	9:09	6853	238	2	10	130	2:41	84	100
1	9	47	9:13	7091	62	2	10	131	2:43	104	61
1	9	48	9:14	5775	236	2	10	132	2:46	0	141
1	9	49	9:14	6095	270	2	10	133	2:47	99	89
1	9	50	9:17	6059	116	2	10	134	2:48	120	86
1	9	51	9:18	6094	125	2	10	135	2:51	34	50
1	9	52	9:21	5943	91	2	10	136	2:53	0	151
1	9	53	9:21	6166	137	2	10	137	2:55	29	149

Legend:

C1 = Teller Number
C2 = Day Number
C3 = Customer Number
C4 = Arrival Time
C5 = Waiting Time in Seconds
C6 = Service Time in Seconds
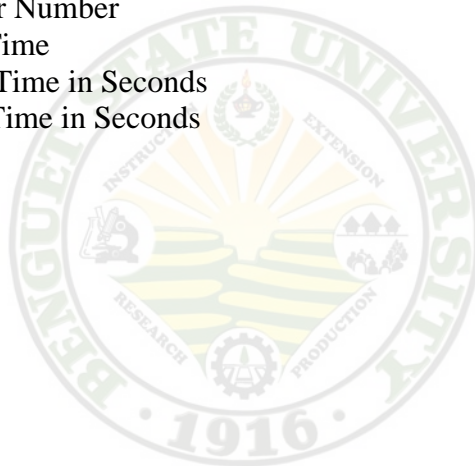
D. Arrival Time and Service Time
Probability
Arrival Time Probability

λ	e	x	P(X ≤ x)
22	2.71828	0	2.1571E10
22	2.71828	1	5.0167E09
22	2.71828	2	5.8445E08
22	2.71828	3	4.5483E07
22	2.71828	4	2.6604E06
22	2.71828	5	1.2479E05
22	2.71828	6	4.8899E05
22	2.71828	7	1.6470E04
22	2.71828	8	4.8688E04
22	2.71828	9	1.2836E03
22	2.71828	10	3.0569E02
22	2.71828	11	0.0066
22	2.71828	12	0.0133
22	2.71828	13	0.0247
22	2.71828	14	0.0428
22	2.71828	15	0.0697
22	2.71828	16	0.1071
22	2.71828	17	0.1560
22	2.71828	18	0.2166
22	2.71828	19	0.2875
22	2.71828	20	0.3664
22	2.71828	21	0.4500
22	2.71828	22	0.5346
22	2.71828	23	0.6165
22	2.71828	24	0.6924
22	2.71828	25	0.7600
22	2.71828	26	0.8179
22	2.71828	27	0.8656
22	2.71828	28	0.9035
22	2.71828	29	0.9326
22	2.71828	30	0.9542
22	2.71828	31	0.9697
22	2.71828	32	0.9805
22	2.71828	33	0.9877
22	2.71828	34	0.9925
22	2.71828	35	0.9955
22	2.71828	36	0.9974
22	2.71828	37	0.9985
22	2.71828	38	0.9992
22	2.71828	39	0.9996
22	2.71828	40	0.9998
22	2.71828	41	0.9999
22	2.71828	42	0.9999
22	2.71828	43	1.0000
22	2.71828	44	1.0000
22	2.71828	45	1.0000
22	2.71828	46	1.0000
22	2.71828	47	1.0000
22	2.71828	48	1.0000
22	2.71828	49	1.0000
22	2.71828	50	1.0000

λ = mean arrival rate
x = number of arrivals

Service Time Probability

μ	e	x	p(st ≤ x)
14	2.71828	0.1	0.7534
14	2.71828	0.2	0.9392
14	2.71828	0.3	0.9850
14	2.71828	0.4	0.9963
14	2.71828	0.5	0.9991
14	2.71828	0.6	0.9998
14	2.71828	0.7	0.9999
14	2.71828	0.8	0.999986
14	2.71828	0.9	0.999997
14	2.71828	1	0.999999

μ = mean service rate
x = service time

E. Multiple-Server Operating Characteristics of Customers Serviced at Landbank-La Trinidad, Benguet

Queueing Analysis: Multiservers (2) Single-Queue	
Inputs	
Time unit	hour
Arrival rate (λ)	22.2571
Service rate (μ)	14.4286
Number of servers (k)	2

Performance measure	
Utilization rate	0.79
Probability that the teller is idle (P_o)	0.12
Average number of the customers in the system (L)	5
Average time a customer spends in the system, hours (W)	0.21
Average number of customers in the queue (L_q)	3
Average time a customer spends in the queue, hours (W_q)	0.14
Probability that an arriving customer has to wait for service (P_w)	0.69

Queueing Analysis: Multiservers (3) Single-Queue	
Inputs	
Time unit	hour
Arrival rate (λ)	22.2571
Service rate (μ)	14.4286
Number of servers (k)	3

Performance measure	
Utilization rate	0.52
Probability that the teller is idle (P_o)	0.19
Average number of the customers in the system (L)	2
Average time a customer spends in the system, hours (W)	0.08
Average number of customers in the queue (L_q)	0.27
Average time a customer spends in the queue, hours (W_q)	0.01
Probability that an arriving customer has to wait for service (P_w)	0.26