

Homework 6 – SEEStat Analysis of USBank

You can download a students' version of the SEEStat program from the course website <http://iew3.technion.ac.il/serveng2010W/index.html> (use the hyperlink: [SEEStat \(student version\)](#) on the cover page of the course). The compressed file you download (365MB) includes (under the library "DVD for Sevice_Engineering students") a ReadMe.html file with the installation instructions of the program SEEStat. The file also includes a database of a USBank from June 2001 to August 2002.

Question 1

Undesirable Service Level

Figures 1 and 2 below show two peaks of the abandons proportions and of the average waiting times, for two different queues – Telesales and Consumer Loans, respectively. Analyze these peaks, showing all the relevant graphs that you use in your analysis, and explaining the information you deduce from each graph.

Note: The analysis you are requested to perform is at the level of the system parameters that caused the above peaks, including reference to the relevant times. An example of such an analysis could be: “the service time grew longer to 300 and the number of agents decreases to 250 agents on 04.07.03 between 10:00-14:30”. Moreover, check whether these peaks also occurred to others performance measures, such as waiting time and delay probability, and refer to it in your answer.

Figure 1: Abandonment rate of Telesales calls

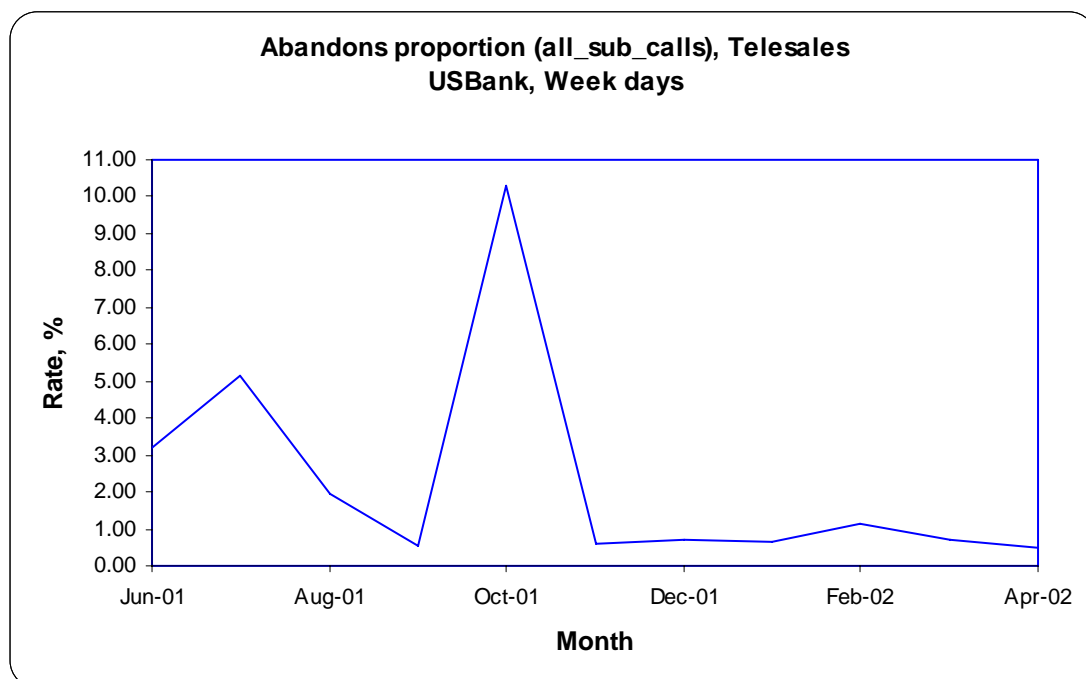
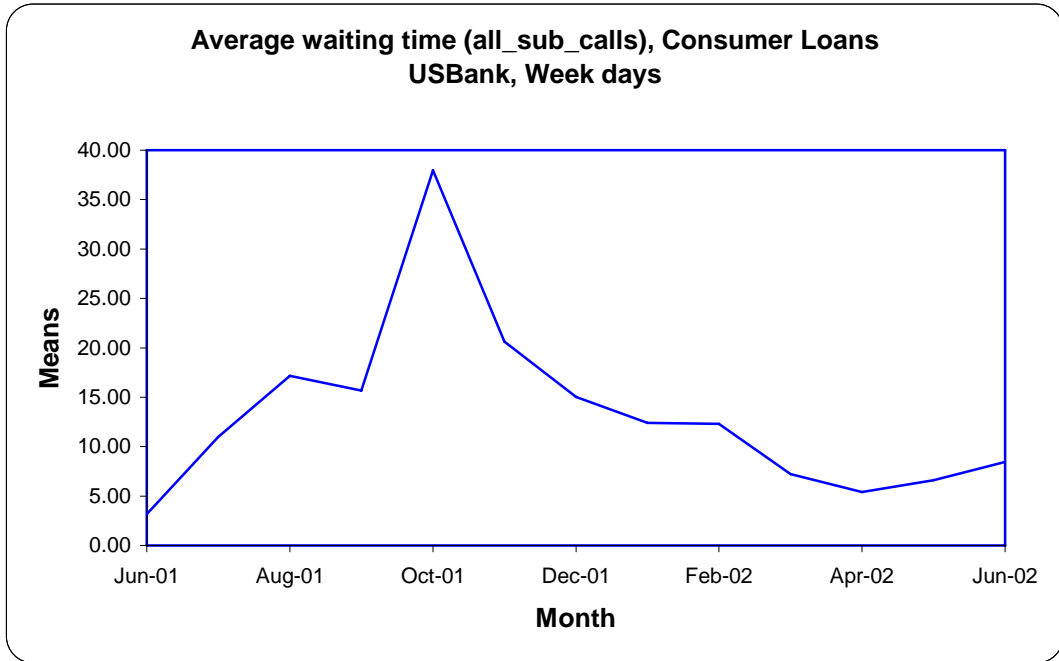


Figure 2: Average waiting time of Consumer Loans calls

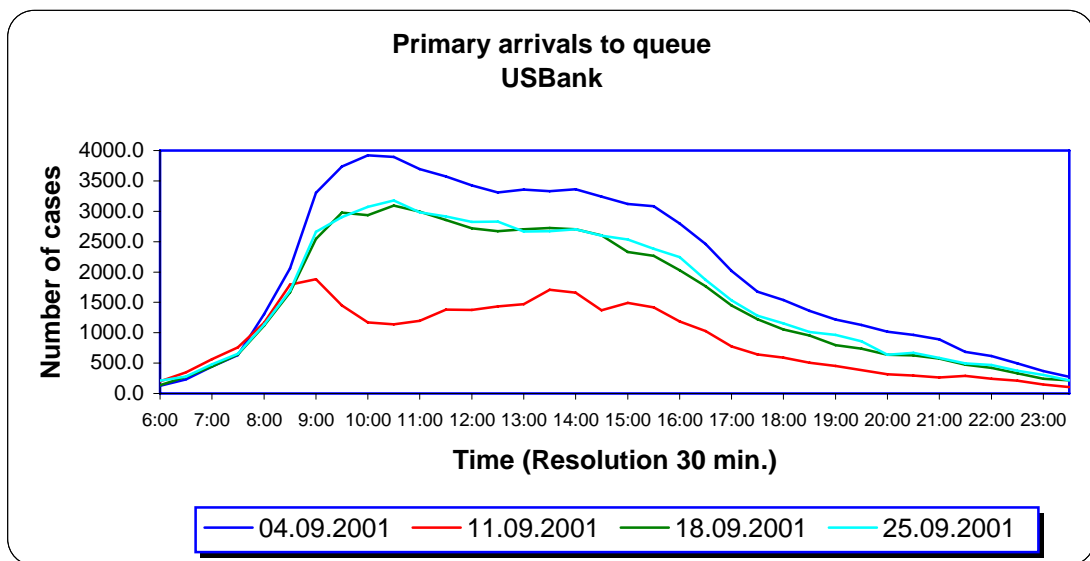


Question 2

The Influence of an Irregular Event

Figure 3 shows the Primary arrivals to queue on Tuesdays in September 2001. Naturally, we know the cause of the small number of arrivals on September 11th 2001; try to find in the database the reason of the discrepancies between the other three days. Based only on Septembers' Tuesdays information, what is your forecast for the number of Primary arrivals to queue on 02.10.2001 and 09.10.2001 (the first and the second Tuesday of October 2001) at 10:30? Explain your answer.

Figure 3



Question 3

Service Time Distributions

Draw a histogram of the Customer Service Time for Business calls, during the weekdays of December 2001. Which distribution, from those you are familiar with, can fit best to the real distribution of these services times? If the empirical distribution has significant differences with the distribution you propose, explain why these discrepancies are or are not relevant.

Question 4

Network Balancing Protocol and Performance Level

With the goal of balancing the queues over the nodes (New-York, Boston, Philadelphia), the system performs according to a protocol that when a call had waited a pre-determined time in its node, the call is placed in an inter-queue, from which the call can be answered at any node.

Use the wait time distributions during February 2002 to identify these pre-determined times, for the Online Banking and the Business calls. Draw the corresponding graphs.

Question 5

Service Levels and Priority Queues

Business and Platinum calls enjoy the same service type, but the Platinum calls are considered VIP calls. Despite the fact that the agents of Business and Platinum services have the same skills, the agents defined as “Business agents” are not qualified to serve Platinum calls, but “Platinum agents” are qualified to serve Business calls.

The marketing manager of the call center claims that service levels are not satisfactory on July 2001. Explain the reasons for the marketing manager claim and draw the graphs to support your explanation. What is the reason for the unsatisfactory service levels? Suggest a way to solve the problem.

Question 6

Create 'Daily Reports' for Business and Platinum services and for the 'Total' calls on both group members' birthdays (total of 6 daily reports). For each date, compare between the different service types (Business, Platinum, Total) and for each service type, compare between the required dates. In your comparisons, refer both to similarities and differences.

Remarks:

1. If your birthday is in either June, July or August, choose the birthday on 2002.
2. If your birthday falls on Saturday, choose the day before (Friday).
3. If your birthday falls on Sunday or on holiday, choose the day after it.