**CE 412 – PROJECT 2**

**“SIMULATION OF A GROCERY STORE”**

A small grocery store has only one checkout counter. Customers arrive at this checkout counter at random from 1 to 8 minutes apart. The service times vary from 1 to 6 minutes. Analyze the system and answer the following questions through a simulation study. The distribution of inter arrival times and service times are illustrated in the tables below. Assume that the first customer arrives at the checkout counter at time *t=0* .

|  |  |
| --- | --- |
| **Distribution of time between arrivals** | |
| **Time between arrivals (mins)** | **Probability** |
| **1** | 1/8 |
| **2** | 1/8 |
| **3** | 1/8 |
| **4** | 1/8 |
| **5** | 1/8 |
| **6** | 1/8 |
| **7** | 1/8 |
| **8** | 1/8 |

|  |  |
| --- | --- |
| **Service Time Distribution** | |
| **Service time (mins)** | **Probability** |
| **1** | 1/10 |
| **2** | 1/5 |
| **3** | 3/10 |
| **4** | 1/4 |
| **5** | 1/10 |
| **6** | 1/20 |

* What is the average time a customer spends in the system?
* What is the average waiting time of a customer?
* What is the average service time of a customer?
* What percentage of the customers wait at the checkout counter?
* What is the average waiting time of the customers who wait?
* What percentage of the time the checkout counter is idle?
* What is the average time between arrivals to the checkout counter?

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***Project 2 Submission***:

Name your program as *yournamePrj2.X* and submit it to Blackboard or e-mail it to [tamer.dag@khas.edu.tr](mailto:tamer.dag@khas.edu.tr) by March 6th, 2014. You have to submit your project report (hard copy) in class on March 6th, 2014. You will also make a demo of your project in class. Late submissions up to one week has a penalty of 50%. Late submissions beyond one week will not be accepted.

***Project 2 Grading:***

* Project Report 30%
* Program 70% (If your program does not produce correct results, you might only get at most 35%)