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**SIE431/531 Simulation Modeling and Analysis**

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**Homework 1**

Problem 1: (simulation by hand) Consider the following interarrival and service times for the first 5 customers to a single server queuing system.

|  |  |  |
| --- | --- | --- |
| Customer Number | Interarrival Time (min) | Service Time (min) |
| 1 | 3 | 4 |
| 2 | 1 | 4 |
| 3 | 3 | 5 |
| 4 | 1 | 3 |
| 5 |  | 2 |

For the above table, the first customer arrives at t = 0. The interarrival time between customer 1 and 2 is 3 minutes, and the interarrival time between customer 2 and 3 is 1 minute. Suppose the simulation ends at t= 16 minutes. Based on the above information, compute the following (show the intermediate steps):

1. The average number of people in queue:
2. The average time in system (time in queue + time in service) for those who have completed service;
3. The average time in system (time in queue + time in service) for the entire simulation run.
4. The server utilization.

Problem 2: Exercise 3-1 in the textbook.

Problem 3: Exercise 3-9 in the textbook.