Assignment 12 Data Analysis

*Note: The following document provides the best possible solution I could give in the time given. Not all data is up to par with the requirements requested by the professor. I was not able to figure out how to utilize the update() function. Because of this, I was not able to utilize the dequeue() function. However, all functions for the Queue and Customer classes work properly and the process of finding the smallest queue also works properly. With this, all randomization and randomization functions work properly, as well.*

Sample Run with Given Input

*Note: Only enqueues in the proper queues are included according to the note.*

C:\Users\zacha\source\repos\Assignment 12 CS255\Debug>"Assignment 12 CS255.exe" 60 1.8 4.2 3 1

You have entered 6 arguments.

Assignment 12 CS255.exe

60

1.8

4.2

3

1

Begin simulation.

Minute 1:

Minute 2:

Minute 3:

Minute 4:

Minute 5:

Minute 6:

Minute 7:

Grace arrives with 4-minute service time

Grace enters queue 1

Minute 8:

Jane arrives with 4-minute service time

Jane enters queue 2

Grace arrives with 4-minute service time

Grace enters queue 3

Mark arrives with 4-minute service time

Mark enters queue 1

Jane arrives with 4-minute service time

Jane enters queue 2

Minute 9:

Mark arrives with 4-minute service time

Mark enters queue 3

Jane arrives with 4-minute service time

Jane enters queue 1

Minute 10:

Minute 11:

Minute 12:

David arrives with 4-minute service time

David enters queue 2

Minute 13:

Minute 14:

David arrives with 4-minute service time

David enters queue 3

Minute 15:

Minute 16:

Minute 17:

Minute 18:

Minute 19:

Sally arrives with 4-minute service time

Sally enters queue 1

Bob arrives with 5-minute service time

Bob enters queue 2

Minute 20:

Sally arrives with 4-minute service time

Sally enters queue 3

Minute 21:

Minute 22:

Minute 23:

Zach arrives with 4-minute service time

Zach enters queue 1

Kenslie arrives with 4-minute service time

Kenslie enters queue 3

Sally arrives with 4-minute service time

Sally enters queue 2

Minute 24:

Luke arrives with 5-minute service time

Luke enters queue 1

Sally arrives with 4-minute service time

Sally enters queue 3

Minute 25:

Minute 26:

Minute 27:

Minute 28:

Minute 29:

Minute 30:

Minute 31:

Minute 32:

Minute 33:

Minute 34:

Luke arrives with 4-minute service time

Luke enters queue 2

Rebecca arrives with 4-minute service time

Rebecca enters queue 3

Grace arrives with 2-minute service time

Grace enters queue 1

Minute 35:

Minute 36:

Grace arrives with 4-minute service time

Grace enters queue 2

Mark arrives with 5-minute service time

Mark enters queue 1

Jane arrives with 4-minute service time

Jane enters queue 3

Minute 37:

Mark arrives with 4-minute service time

Mark enters queue 2

Jane arrives with 5-minute service time

Jane enters queue 1

Minute 38:

Minute 39:

Minute 40:

David arrives with 4-minute service time

David enters queue 3

Mark arrives with 4-minute service time

Mark enters queue 2

Jane arrives with 3-minute service time

Jane enters queue 3

Minute 41:

Minute 42:

Minute 43:

Minute 44:

Minute 45:

Minute 46:

Minute 47:

Minute 48:

Kenslie arrives with 4-minute service time

Kenslie enters queue 1

Minute 49:

Bob arrives with 5-minute service time

Bob enters queue 2

Kenslie arrives with 5-minute service time

Kenslie enters queue 3

Minute 50:

Minute 51:

Sally arrives with 4-minute service time

Sally enters queue 1

Minute 52:

Kenslie arrives with 4-minute service time

Kenslie enters queue 2

Minute 53:

Minute 54:

Minute 55:

Sally arrives with 4-minute service time

Sally enters queue 3

Zach arrives with 4-minute service time

Zach enters queue 1

Minute 56:

Rebecca arrives with 5-minute service time

Rebecca enters queue 2

Zach arrives with 4-minute service time

Zach enters queue 3

Minute 57:

Rebecca arrives with 4-minute service time

Rebecca enters queue 1

Zach arrives with 4-minute service time

Zach enters queue 3

Minute 58:

Minute 59:

Grace arrives with 4-minute service time

Grace enters queue 2

Luke arrives with 4-minute service time

Luke enters queue 1

Rebecca arrives with 5-minute service time

Rebecca enters queue 3

Minute 60:

Mark arrives with 4-minute service time

Mark enters queue 2

MEAN WAIT TIME(NOT WORKING): 57

Sample Runs with Fixed Parameters Except the Number of Queues

**RUN 1**

C:\Users\zacha\source\repos\Assignment 12 CS255\Debug>"Assignment 12 CS255.exe" 20 1.8 4.2 1 0

You have entered 6 arguments.

Assignment 12 CS255.exe

20

1.8

4.2

1

0

Begin simulation.

Jane arrives with 4-minute service time

Jane enters queue 1

Kenslie arrives with 5-minute service time

Kenslie enters queue 1

Bob arrives with 4-minute service time

Bob enters queue 1

Bob arrives with 4-minute service time

Bob enters queue 1

Sally arrives with 4-minute service time

Sally enters queue 1

Kenslie arrives with 4-minute service time

Kenslie enters queue 1

Zach arrives with 4-minute service time

Zach enters queue 1

Sally arrives with 4-minute service time

Sally enters queue 1

Zach arrives with 2-minute service time

Zach enters queue 1

Rebecca arrives with 6-minute service time

Rebecca enters queue 1

Zach arrives with 3-minute service time

Zach enters queue 1

Grace arrives with 4-minute service time

Grace enters queue 1

MEAN WAIT TIME(NOT WORKING): 48

**RUN 2**

C:\Users\zacha\source\repos\Assignment 12 CS255\Debug>"Assignment 12 CS255.exe" 20 1.8 4.2 2 0

You have entered 6 arguments.

Assignment 12 CS255.exe

20

1.8

4.2

2

0

Begin simulation.

Bob arrives with 4-minute service time

Bob enters queue 1

Jane arrives with 4-minute service time

Jane enters queue 2

Kenslie arrives with 4-minute service time

Kenslie enters queue 1

David arrives with 2-minute service time

David enters queue 2

Bob arrives with 4-minute service time

Bob enters queue 2

Kenslie arrives with 4-minute service time

Kenslie enters queue 1

Zach arrives with 6-minute service time

Zach enters queue 2

Luke arrives with 4-minute service time

Luke enters queue 1

Sally arrives with 4-minute service time

Sally enters queue 1

Zach arrives with 4-minute service time

Zach enters queue 2

Luke arrives with 4-minute service time

Luke enters queue 1

Zach arrives with 4-minute service time

Zach enters queue 2

Rebecca arrives with 5-minute service time

Rebecca enters queue 1

Luke arrives with 4-minute service time

Luke enters queue 2

Mark arrives with 4-minute service time

Mark enters queue 2

Rebecca arrives with 4-minute service time

Rebecca enters queue 1

Grace arrives with 3-minute service time

Grace enters queue 2

MEAN WAIT TIME(NOT WORKING): 16

**RUN 3**

C:\Users\zacha\source\repos\Assignment 12 CS255\Debug>"Assignment 12 CS255.exe" 20 1.8 4.2 3 0

You have entered 6 arguments.

Assignment 12 CS255.exe

20

1.8

4.2

3

0

Begin simulation.

Kenslie arrives with 4-minute service time

Kenslie enters queue 1

Sally arrives with 3-minute service time

Sally enters queue 2

Zach arrives with 4-minute service time

Zach enters queue 3

Luke arrives with 3-minute service time

Luke enters queue 2

Rebecca arrives with 4-minute service time

Rebecca enters queue 1

Zach arrives with 4-minute service time

Zach enters queue 3

Grace arrives with 6-minute service time

Grace enters queue 2

Luke arrives with 3-minute service time

Luke enters queue 1

Rebecca arrives with 6-minute service time

Rebecca enters queue 3

Grace arrives with 3-minute service time

Grace enters queue 1

Luke arrives with 4-minute service time

Luke enters queue 2

Rebecca arrives with 5-minute service time

Rebecca enters queue 1

Jane arrives with 4-minute service time

Jane enters queue 3

Grace arrives with 2-minute service time

Grace enters queue 2

David arrives with 4-minute service time

David enters queue 2

Mark arrives with 4-minute service time

Mark enters queue 3

Jane arrives with 5-minute service time

Jane enters queue 1

Jane arrives with 4-minute service time

Jane enters queue 2

David arrives with 4-minute service time

David enters queue 3

Bob arrives with 3-minute service time

Bob enters queue 1

Jane arrives with 5-minute service time

Jane enters queue 2

David arrives with 3-minute service time

David enters queue 3

David arrives with 4-minute service time

David enters queue 1

MEAN WAIT TIME(NOT WORKING): 29

**RUN 4**

C:\Users\zacha\source\repos\Assignment 12 CS255\Debug>"Assignment 12 CS255.exe" 20 1.8 4.2 4 0

You have entered 6 arguments.

Assignment 12 CS255.exe

20

1.8

4.2

4

0

Begin simulation.

David arrives with 4-minute service time

David enters queue 1

Mark arrives with 4-minute service time

Mark enters queue 2

David arrives with 4-minute service time

David enters queue 3

Bob arrives with 2-minute service time

Bob enters queue 4

Jane arrives with 4-minute service time

Jane enters queue 4

Kenslie arrives with 4-minute service time

Kenslie enters queue 1

Zach arrives with 4-minute service time

Zach enters queue 2

MEAN WAIT TIME(NOT WORKING): 4

Explanation of Sample Runs Above

In the first simulation run, we can see that there are random names, random service times, and they all enter the 1 queue accordingly.

In the second simulation run, we can see that if one queue becomes larger than the other, the enqueued customer will go to the queue with the shortest total service time.

In the third simulation run, all goes accordingly. The shortest queue will be selected first based of the total service time of said queue.

In the fourth run, we see a more isolated example of the simulation picking the correct queue. All queues 1, 2, and 3 end up having a service time of 4. Then, queue 4 has a service time of 2. This leads the simulation to choose 4 in the following enqueue because it is the smallest queue available.

If all queues consist of the same service time, the default is to choose the first queue available and go down the line (1 to 4).

Unfortunately, I did not figure out how to dequeue or find the max and mean service times. I think I made the simulation more complex than it needed to be, so I ended up getting lost in some of the areas. Next time, I will need to plan out a checklist of what to do rather than go at it without any plan.