CS515: Computer System Lab 2

Date: 20th Jan 2022 Assignment 3
Submission Filename: assign3.c or assign3.cpp and assign3README.txt Due Date: 23rd Jan 2022 9:00 am

1 Problem Description

The manager of City Bank of India's Bihta branch wants to develop a program that will help him to find the average waiting time a customer spending at the bank. This information is important for the manager as based on that he will be planning to hire more number of staff for this branch if required.

Currently the branch has two counters that provide various services to the customers who come to the branch. The *serviceType* that a customer can request are as follows-

- MW: refers to money withdrawal. On an avg, it takes **x** amount time to perform
- MD: refers to money deposit. On an avg, it takes **y** amount time to perform
- DD: Issue of demand draft. On an avg, it takes **z** amount time to perform

The bank can receive the details of every customer who are arriving at the branch using *custID*, *arrivalTime* and *serviceType* from an input file (ip.txt). The bank maintains a single queue and both the counters can serve all type of requests. If the arrival time of multiple customers are same then they will be positioned in the queue based on the order mentioned in the input file. Once a service request is completed then counter can process the next request immediately. We can assume that switching to the next request time is negligible.

Also, once a service request of a customer is fulfilled then it is considered as a *finishTime* of the customer and it is assumed that at *finishTime* the corresponding customer leaves the branch immediately. Thus, the time the customer spends at the branch is the difference between the *finishTime* and *arrivalTime*.

You need to simulate the aforementioned behavior of the customers at the branch and calculate the *finishTime*, *waitTime* of each customers. Also, you need to print the average waiting time considering all the customers in op.txt file.

2 Sample Input Output

Contents of *ip.txt* should reflect the values of time required for different serviceTypes and the custID, arrivalTime and serviceType for each customer

15 /*indicates x value or time needed for MW*/
10 /*indicates y value or time needed for MD*/
30 /*indicates z value or time needed for DD*/
/*Each of the following entries represent *custID*, *arrivalTime* and *serviceType*/
101 0 MW
102 0 MD
103 2 MD
104 4 DD
105 10 MD

The program should generate an output file where each entry indicates *custID*, *arrivalTime*, *finishTime*, *waitingTime* of all customers followed by Average waiting time

Contents of *op.txt* file

101,0,15,15
102,0,10,10
103,2,20,18
104,4,45,41
105,10,30,20
Average waiting time is 20.8

3 Submission

Submit the assignment using the submission link provided in the following course page only.

`https://www.iitp.ac.in/~samrat/CompSysLab2_CS515/`

4 Guidelines

- Do not use any library/package (eg. STL etc) to implement this. Your code must be well documented (use appropriate comments and indentation) and any invalid input must also be handled properly.
- After the due date and time (mentioned at top right with red font), the submission will remain open for 12 hours more. However, submission after due time will be treated as late submission and there will be 20% penalty for such late submission. As lab instructor or the TAs may not be available to fix the login/ networking problem at the last moment so upload the assignment well in advance to avoid any last minute glitches.
- There will be penalty if you are found to take any unfair means during the assignment submission process.
- Copying others' program and allowing others to copy your program will be penalized equally.