National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Data Structures**	**Course Code:**	**CS 2001**
Program:	**BS (Software Engineering)**	**Semester:**	**Fall 2023**
Due Date	**1-NOV-2023 at 11:59 pm**	**Total Marks:**	**20**
Section:	**1A**	**Page(s):**	**3**
Type:	**Homework 1**		

Important Instructions:

1. Put your .cpp file into a zip folder and upload it onto the google classroom submission folder. Name your solution file with your roll number, i.e., HW1_22L_1111.zip. Assignment in any other format (extension) will not be accepted and will be awarded with zero marks.
2. You are not allowed to copy solutions from other students. We will check your solution for plagiarism using plagiarism checkers. If any sort of cheating is found, negative marks will be given to all students involved.
3. Late submission of your solution is not allowed. For each passing day after deadline, 20% of the marks will be deducted. Three days after the deadline, no submission will be accepted.

Question # 1: [Marks 20]

Suppose you are in a grocery store (like Carrefour) for your monthly grocery shopping. In this grocery store, there are four counters where you can pay your bills. In order, to pay your bill you are required to stand in one of the four counters. Most of the times in these situations we prefer to stand in the shortest queue. And Sometimes in these stores, they give priority to the senior citizens.
Considering the above scenario, write a C++ program which will place each customer willing to pay his/her bill in the shortest possible queue. In this case, you have to implement priority queues in which priority will be given on the basis of age. Your program will ask a user about the number of items purchased and his/her age and place him in one of the four queues in the right position.

Your output should look like this:

Do you want to pay your bills (**Y/N): Y**
C1:
Please enter how many items do you want to purchase=**6**
Please enter your age=**21**

Queue 1	Queue 2	Queue 3	Queue 4
C1(6,21)			

Do you want to pay your bills (**Y/N): Y**
C2:
Please enter how many items do you want to purchase=**10**
Please enter your age=**20**

Queue 1	Queue 2	Queue 3	Queue 4
C1(6,21)	C2(10,20)		

Do you want to pay your bills (**Y/N): Y**
C3:
Please enter how many items do you want to purchase=**20**
Please enter your age=**18**

Queue 1	Queue 2	Queue 3	Queue 4
C1(6,21)	C2(10,20)	C3(20,18)	

Do you want to pay your bills (**Y/N): Y**
C4:
Please enter how many items do you want to purchase=**5**
Please enter your age=**22**

Queue 1	Queue 2	Queue 3	Queue 4
C1(6,21)	C2(10,20)	C3(20,18)	C(5,22)

Do you want to pay your bills (**Y/N): Y**
C5:
Please enter how many items do you want to purchase=**5**
Please enter your age=**21**

Queue 1	Queue 2	Queue 3	Queue 4
C1(6,21)	C2(10,20)	C3(20,18)	C4(5,22)
			C5(5,21)

Do you want to pay your bills (**Y/N): Y**
C6:
Please enter how many items do you want to purchase=**8**
Please enter your age=**30**

Queue 1	Queue 2	Queue 3	Queue 4
C6(8,30)	C2(10,20)	C3(20,18)	C4(5,22)
C1(6,21)			C5(5,21)

Do you want to pay your bills (**Y/N): Y**
C7:
Please enter how many items do you want to purchase=**9**
Please enter your age=**15**

Queue 1	Queue 2	Queue 3	Queue 4
C6(8,30)	C2(10,20)	C3(20,18)	C4(5,22)
C1(6,21)	C7(9,15)		C5(5,21)

Do you want to pay your bills (**Y/N): Y**
C8:
Please enter how many items do you want to purchase=**15**
Please enter your age=**31**

Queue 1	Queue 2	Queue 3	Queue 4
C6(8,30)	C2(10,20)	C3(20,18)	C8(15,31)
C1(6,21)	C7(9,15)		C4(5,22)
			C5(5,21)

Do you want to pay your bills (**Y/N): N**
Exit