**Data Structures BS (CS, SE)-III**

**Fall 2019**

**Assignment 4**

**Dated: 8th October 2019**

**Deadline: 20th October 2019 Instructor: Dr. Sajid Khan**

**Dear Students,**

**You have to send the solution of this assignment to the following email address**

[assignmentscollectiondrsajid@gmail.com](mailto:assignmentscollectiondrsajid@gmail.com)

**The subject of email should be YourName\_Section\_DSAssignmant4\_Fall19**

1. Implement a priority queue using linked list for hospital administration where patients are categorized into the following priorities  
     
   a. Normal patients with Priority 0  
   b. Patient that pay double fee with priority 1  
   c. Patients who can’t wait longer due to some diseases such as neurological issues with priority 2  
   d. Serious patients with priority 3

You should implement all the functions, however, addQueue function should follow the priority. For example, if we have the following instructions

queueType<string> Q1;

Q1.addQueue("AAA", 0);

Q1.addQueue("AAB", 0);

Q1.addQueue("AAC", 0);

Q1.addQueue("AAD", 3);

The queue should look like



If a few more instructions are provided, such as

Q1.addQueue("AAE", 0);

Q1.addQueue("AAF", 3);

Q1.addQueue("AAG", 2);



deleteQueue function should simply delete the first node. You should use both front and rare pointers.

1. Implement operator overloaded function for the operator “-“ that perform subtraction of data of corresponding nodes of two lists (List1-List2) and **return** the resultant list. There are three cases that needs to be handled
   1. List1 have lesser nodes. For example, List1 is [A1, B1, C1] and List2 is [A2, B2, C2, D2, E2]. In that case, you have to assume that the missing nodes of List1 have data of zero. So the assumed values of List1 in this case will be [A1, B1, C1, 0, 0].
   2. List2 have lesser nodes. For example, List1 is [A1, B1, C1, D1, E1, F1] and List2 is [A2, B2]. In that case, you have to assume that the missing corresponding nodes of List2 have data of zero. So the assumed values of List2 in this case will be [A2, B2, 0, 0, 0, 0].
   3. List1 and List2 have equal number of nodes. This case is not a problem at all.