NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
Department of Computer Science and Engineering

Guidelines for submitting the assignment:

1. The assignments should be handwritten with your signature and enrollment number on each page.

2. The assignment sheets should be scanned and converted into a PDF and the PDF should be named as per the Enrollment Number of the student.

3. Due date for Assignment 3 : **10th June 2020**

4, Assignment 3 should be emailed to : **gousiahabib_01phd19@nitsri.net**

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1. **[4]** Using a singly linked list data structure, write functions so that the list can be operated on a FIFO basis. Mention any assumptions clearly before writing the functions.

2. **[2]** Show by way of figures and output when the following are run on an empty stack. Also, print the output sequence.

> **pop(); push(13); push(42); pop(); push(12); pop(); push(10); pop(); pop(); pop();**

3. **[2]** Consider an initially empty queue and find the final output for the following sequence of queue operations. Draw the queue in steps and write down the output in sequence.

> **enqueue(17); enqueue(90); enqueue(11); dequeue(); enqueue(18); dequeue(); dequeue(); enqueue(62); enqueue(84); dequeue(); enqueue(20); enqueue(1); dequeue();**

4. **[2,2]** In the Queue :

Front	20	30	40	10	5	6	7	Rear

    i.   What are the steps required to delete 40 when you have only two functions available (AddRear() and DeleteFront()).

    ii.   What is the final queue after Step (i) is followed by the following sequence of operations:

AddRear(200); AddRear(34); AddRear(-5); DeleteFront(); DeleteFront(); AddRear(56)

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5. **[4]** What is the main difference between Queue and Priority Queue? If DeleteFront() and AddRear() are the only two functions available in the Priority Queue, how will you enhance the efficiency of the Priority Queue so that we can get the high priority element out of the Queue (Delete it) as fast as possible?

6. [4] Give at least two real-world applications that benefit from Queue and Deque (two applications for each of them).