Object Oriented Programming LAB – BSEF19
(Morning and Afternoon)
Lab 06 – 30-10-2020

Task 01 (10+10 Marks)

Consider the coding of class **list** and create a class **Queue**. A Queue is a collection in which the data is stored and extracted in exactly same order, i.e., the first value stored in the queue should be the first value to removed and them second and third, and so on. The public member functions for class Queue are described below.

```
class Queue
{
private:
    // member variables
    // member functions
public:
    // member functions
    Queue(){} // to initialize Queue object to store sufficient values
    bool isEmpty(){} // return true if queue is empty
    void enQueue(string person){} // to add person in a queue
    string deQueue(){} // to remove a person from queue and return it
    void printQueue(){} // to print queue in order
};
```

You have to define appropriate data members to properly implement the member functions listed in class Queue. Later test these functions.

Now create program to use the Queue as described next. You have to simulate a bank counter to serve various person arrived to submit fee. The names of person are provided as strings one on each line stored in a file. In main logic, you have to run an indefinite loop. In each of its iteration, generate a random number. If that random number is divisible by 3 or 13 or 47 or 763, it indicates that a new person is arrived. If that random number is divisible by 5 or 11 or 31 or 161 or 2107, it indicates that a person is served completely. If the number generated is not satisfying the above conditions, no action should be taken in that iteration of the loop. You have to create a Queue before entering in the loop and if iteration encounters an arrival, you have to add a name from the file into the queue. The name should be from the line number obtained from the remainder of random number generated by dividing it on total number of files. If iteration of the loop is for service completion, you have to remove the name from the queue and associate it with the officer on the counter.

The output of each iteration of the loop should be displayed and stored in a file as well is like

```
Queue is empty at time 0
Queue is empty at time 1
Raheel is arrived and entered in the queue at time 2
Raheel is being served at time 2
Raheel is being served at time 3
Lateef is arrived and entered in the queue at time 4
Raheel got free at time 5
Lateef being served at time 5

…
```