

## Data Structures and Algorithms Lab

SE-F22

LAB-08

Issue Date: March 28, 2024

**Start Time: 8:15AM**

**Total Marks: 30**

### The objective of this lab is to:

Learn how priority queue works.

### Instructions:

- 1) Follow the question instructions very carefully, no changes in function prototypes are allowed.
- 2) Make separate header files for ADTs. (.h\_for function prototypes) (.cpp for function implementations)

### Task 01( Priority Queue)

**[30 Marks]**

A prestigious event is taking place, which would have all kinds of guests with varying importance. The manager has tasked you with developing a program to manage the event using priority queues. The system will prioritize guests based on their importance level, ensuring exclusive experience for VIP attendees.

You will implement the system using **two arrays**: one for storing guest information and another for storing their priority levels. Each guest will be represented by a **Guest** class containing the following attribute:

- string name: Guest's name.
- string contact number: Guest's contact number.

The priority array will store the importance level of each guest, ranging from 1 to 5, with 5 being the highest. max size of arrays will be 100

```
class Guest {
public:
    string name;
    string affiliation;
    string contactNumber;
    // Constructors
};

class GuestList {
private:
    static const int maxSize = 100;
    Guest* guests[maxSize]; // guest information
    int priorities[maxSize]; // guest priorities
    int rear;

public:
    // Constructor
    GuestList();

    // Destructor
    ~GuestList();
};
```

```
// Enqueue operation
void enqueue(Guest* guest, int priority);

// Dequeue operation
Guest* dequeue();

// Top Operation
Guest* top()

// Check if the guest list is empty
bool isEmpty() const;

// Check if the guest list is full
bool isFull() const;
};
```

Create a main demonstrating the priority queue with at least 5 guests, this has weightage of 5 marks.

**Good Luck!**

---