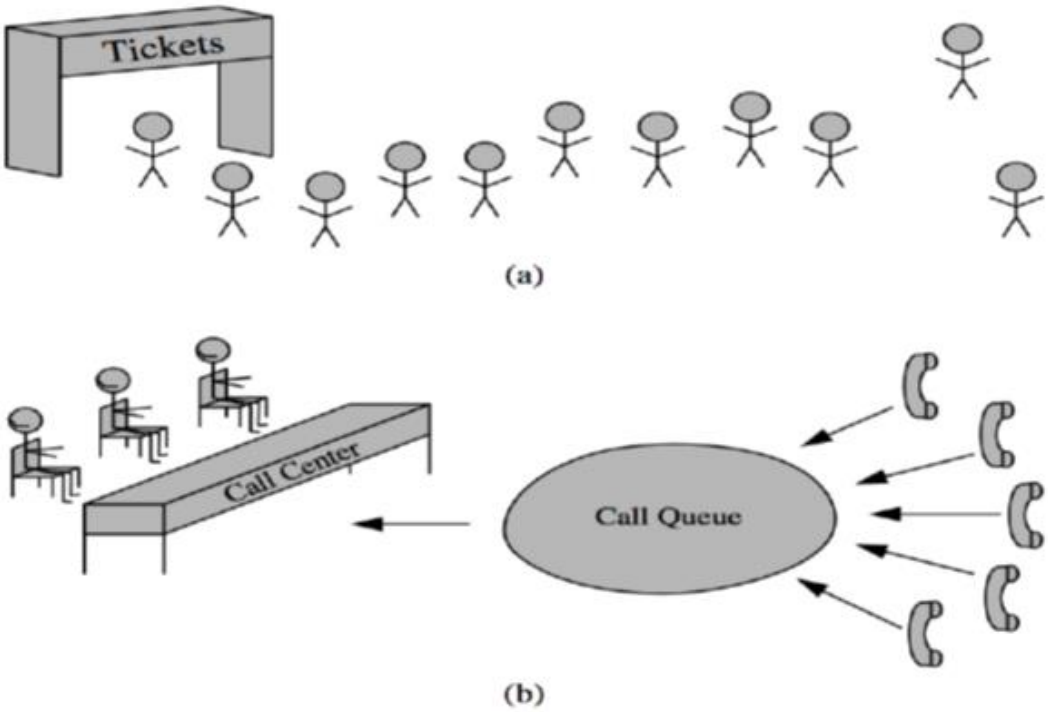
The School Electrical Engineering and Information Technology
Computer Science Department

CS223 Lab
Queue

Definition:

Queue is a collection of elements that are inserted and removed according to the ***first-in, first-out*** (***FIFO***) principle.



Real-world examples of a first-in, first-out queue. (a) People waiting in line to purchase tickets; (b) phone calls being routed to a customer service center.

Main Operations

- **Enqueue**

Add element to the back of queue.

- **Dequeue**

Remove the first element from queue; an error occurs if the queue is empty.

- **IsFull**

Return true if queue is full.

- **IsEmpty**

Return true if queue does not contain any elements.

- **Display**

Printing queue elements.

Lab Work

Based on the definition of Queue, Complete the following C++ code with the main Queue operations to provide a full implementation for an **Array-based** Queue Using an Array Circularly (The end of the array "wraps around" to the start of the array).

Note : Dequeue operation should return 1 if the item is removed and -1 if the queue is empty.

```
#include <iostream>
using namespace std;
const int maxsize=10;
int Qarray[maxsize];
int  front = - 1, rear = - 1;
int isfull(){
   if (front == ((rear + 1)%maxsize))
      return 1;

   return 0;
}
int isempty(){
   if (front == -1)
   {
      return 1;
   }
  return 0;
}

// Enqueue operation
void enqueue(int value) {


}
// Dequeue operation
void dequeue() {


  }

void print(){
   int i;
   if (isempty())
     cout<<"Empty Queue"<<endl;
   else
   {
      cout<<"The queue is:"<<endl;
      for (i = front; i != rear; i = (i + 1) % maxsize)
      {
```

```
          cout<<Qarray[i]<<endl;
       }
    cout<<Qarray[i];

  }
}

int main() {
  enqueue(15);
  enqueue(25);
  enqueue(35);
 cout<<"\n";
  print();

}
```