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Lab - 3

1) Write a program to simulate the working of the queue of integers using an array. Provide the following operations: Insert, delete, display. The program should print appropriate message for overflow and underflow condition

ans)

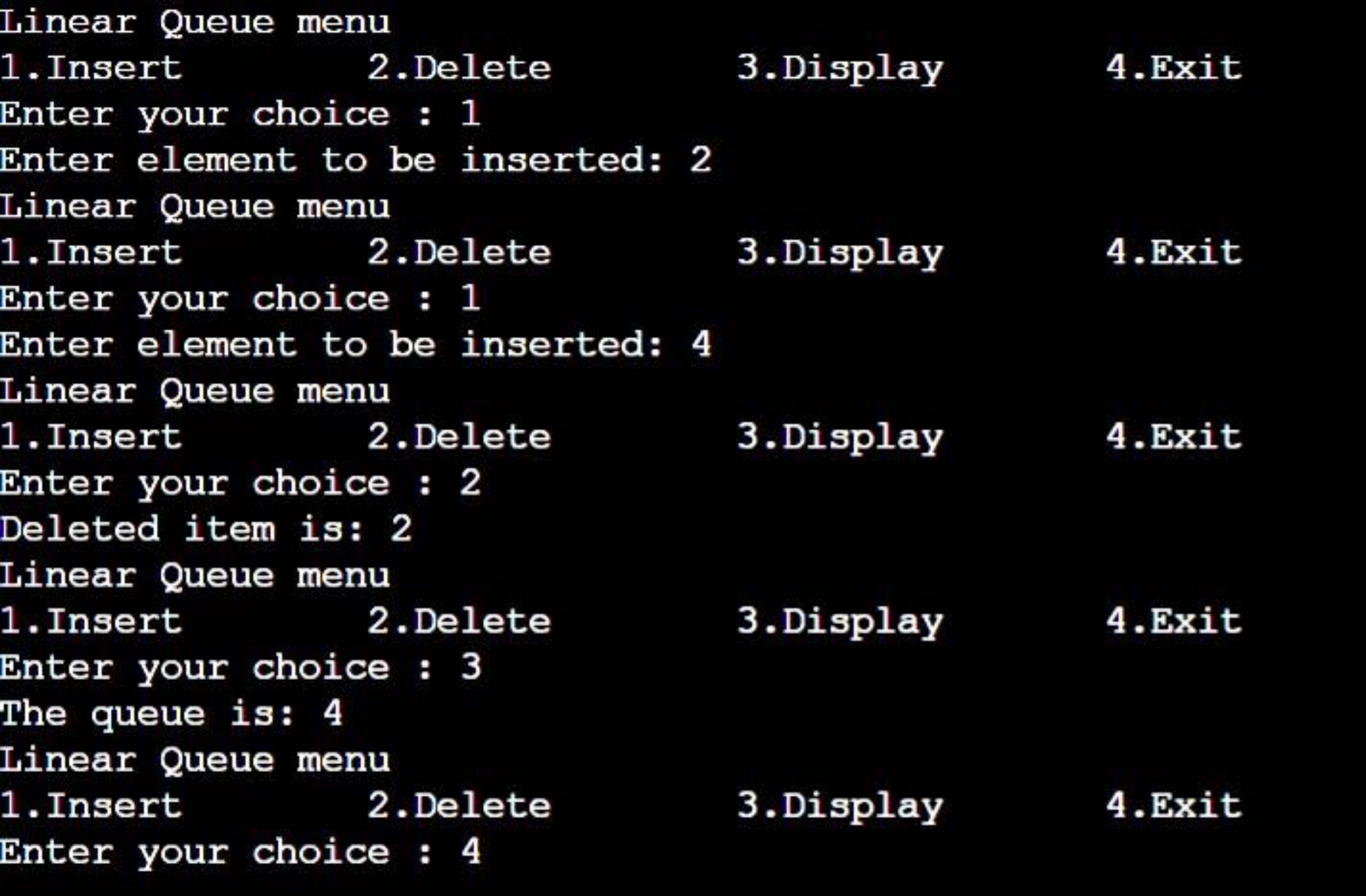
```
#include <stdio.h>
# define MAX 30
int queue [MAX];
int rear = -1, front = -1;

Void insert ()
{
    int item ;
    if (rear == MAX-1)
        printf(" Queue overflow");
    else
    {
        if (front == -1)
            front = 0;
        printf(" Enter the element to be
        inserted :");
        scanf("%d", & item);
        rear = rear+1;
        queue[rear] = item;
    }
}
void delete()
{
    if (front == -1 || front > rear)
    {
        printf(" Queue underflow");
    }
```

```
        else
        {
            printf("Deleted item is = %d\n", queue[fron
            front = front + 1;
        }
}
void display()
{
    int i;
    if (front == -1)
        printf("Queue is empty\n");
    else
    {
        printf("The queue is:");
        for (i = front ; i <= rear ; i++)
            printf("%d\t", queue[i]);
    }
}
void main()
{
    int choice;
    while (1)
    {   printf("\nLinear Queue Menu\n");
        printf("1. Insert\t 2. Delete\t 3. Display\t
        4. exit");
        printf("\nEnter your choice:");
        scanf("%d", &choice);
        switch (choice)
        {
            case 1: insert();
                    break;
            case 2: delete();
                    break;
            case 3: display();
            break;
        case 4: exit(0);
        default: printf("Invalid choice");
                 break;
      }
   }
}
```

OUTPUT:

```
Linear Queue Menu
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice: 1
Enter the element to be inserted: 2
Linear Queue Menu
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice: 1
Enter the element to be inserted: 4
Linear Queue Menu
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice: 2
Deleted item is : 4
Linear Queue Menu
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice: 3
The queue is : 2
Linear Queue Menu
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice: 4
```



```
Linear Queue menu
1.Insert        2.Delete        3.Display       4.Exit
Enter your choice : 1
Enter element to be inserted: 2
Linear Queue menu
1.Insert        2.Delete        3.Display       4.Exit
Enter your choice : 1
Enter element to be inserted: 4
Linear Queue menu
1.Insert        2.Delete        3.Display       4.Exit
Enter your choice : 2
Deleted item is: 2
Linear Queue menu
1.Insert        2.Delete        3.Display       4.Exit
Enter your choice : 3
The queue is: 4
Linear Queue menu
1.Insert        2.Delete        3.Display       4.Exit
Enter your choice : 4
```

ans)

```
# include <stdio.h>
# define SIZE 30
int queue [SIZE];
int front =-1, rear = -1;

Void insert () {
    int item
    if ((front ==rear+1) || (front ==0 && rear== SIZE
    {

        printf(" Queue overflow\n");
    }
    else
    {

        if (front ==-1)
            front =0;
        printf("Enter the item to be inserted
        scanf("%d", &item);
        rear= (rear+1) % SIZE;
        queue [rear] = item;
    }
}
void delete()
{

    int element;
    if (front == -1)
```

```
        printf(" Queue underflow");
    }
    else
    {
        element = queue [front];
        if (front == rear)
        {
            front = -1;
            rear = -1;
        }
        else
        {
            front = (front +1) % SIZE;
        }
        printf(" Deleted item is : %d", element);
    }
}
void display()
{
    int i;
    if (front == -1)
    {
        printf(" Queue is empty");
    }
    else
    {
        printf(" The queue is :");
        for (i = front; i != rear; i = (i+1) % SIZE)
        {
            printf(" %d\t", queue[i]);
        }
        printf(" %d", queue [i];
    }
}
```

```
void main()
{
        int choice;
        while(1)
        {
            printf("1. insert \t 2. delete \t 3. display
            4. exit\n");
            printf("Enter your choice:");
            scanf("%d",&choice);
            switch (choice)
            {
                case 1: insert();
                        break;
                case 2: delete();
                        break;
                case 3: display()
                        break;
                case 4: exit(0);
               default: printf("Invalid input");
                        break;
            }
        }
}
```

Both
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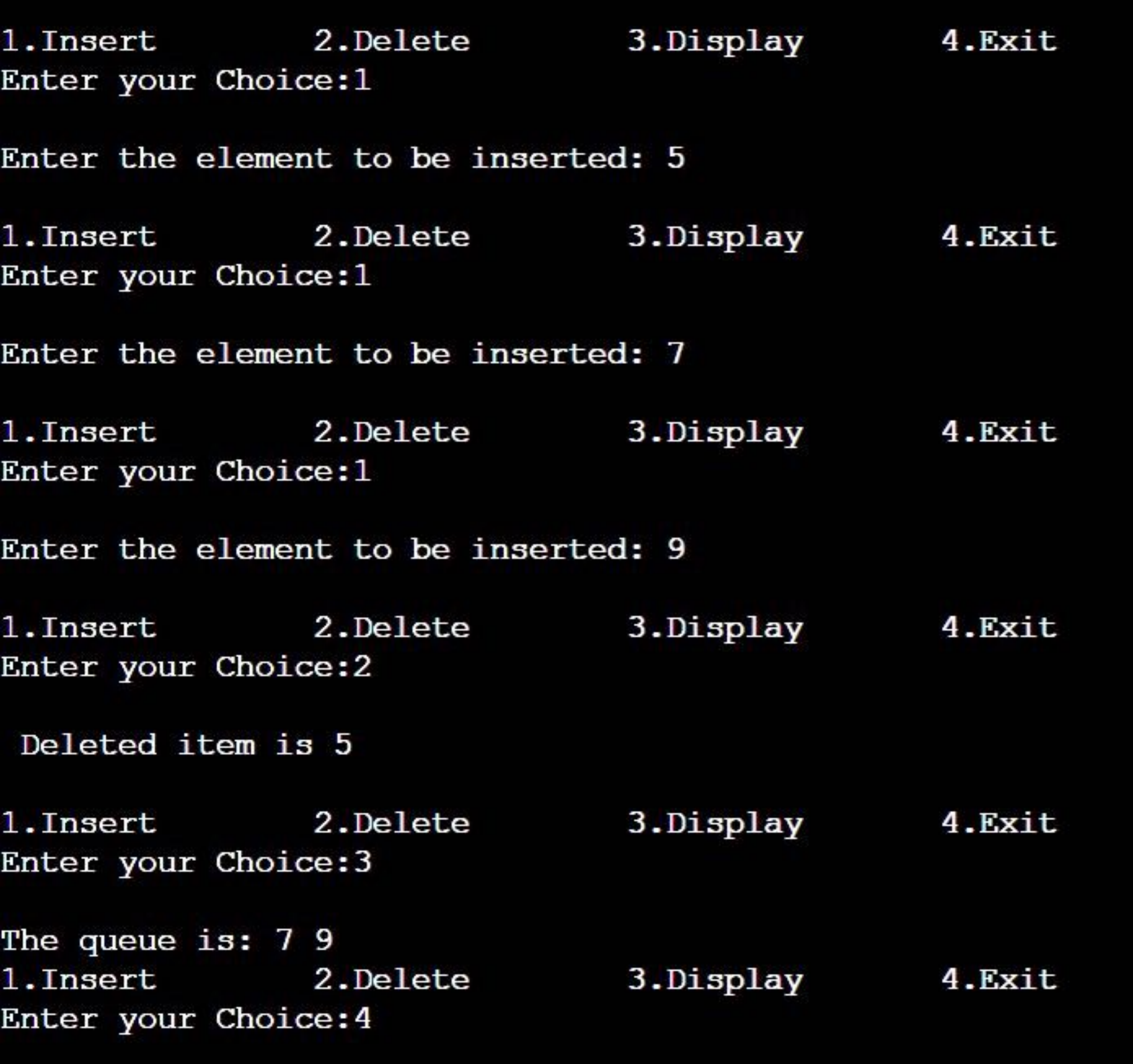
OUTPUT :

```
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice : 1
Enter the item to be inserted : 2
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice : 2
Deleted item is 2
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice : 3
Queue is empty
1. Insert    2. Delete    3. Display    4. Exit
Enter your choice : 4
```



```
1.Insert        2.Delete        3.Display       4.Exit
Enter your Choice:1

Enter the element to be inserted: 5

1.Insert        2.Delete        3.Display       4.Exit
Enter your Choice:1

Enter the element to be inserted: 7

1.Insert        2.Delete        3.Display       4.Exit
Enter your Choice:1

Enter the element to be inserted: 9

1.Insert        2.Delete        3.Display       4.Exit
Enter your Choice:2

 Deleted item is 5

1.Insert        2.Delete        3.Display       4.Exit
Enter your Choice:3

The queue is: 7 9
1.Insert        2.Delete        3.Display       4.Exit
Enter your Choice:4
```