LAB PROGRAM (QUEUE)

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Write a program to simulate working of a queue of integers using an array. Provide the following opeation: Insert, Delete Display print appropriate messages for queue empty and queue overflow condition.

Pseudo code

1 define size of queue and set front and rear as -1

2 To insert check if rear = size-1 if yes then stack overflow otherwise increment value of rear by 1 and insirt the element in rear

3 To delete check if front = -1 or front > rear if yes then print stack underflow otherwise increment value of front by 1.

4 To display iterate and print through a loop in the array.

5 Use switch case in a loop to call appropriate function.

```
#include <stdio.h>
#define SIZE 5

int queue[SIZE];
int front=-1, rear=-1;

void enqueue(int value)
  {
    if(rear== SIZE-1)
    {
     printf("Queue Overflow\n");
     return;
    }
    if (front==-1)
     {
       front=0;
     }
    rear++;
    queue[rear]=value;
    printf("Inserted %d\n", value);
  }
void dequeue
   {
    if(front==-1 || front > rear)
     {
      printf("Queue Underflow\n");
      return;
     }
   printf("Deleted %d\n", queue[front]);
   front++;
   if(front>rear)
    { front= rear=-1; } }
```

```
void display()
{
  if  (front==-1)
    {
      printf("Queue is empty\n");
      return;
    }
  printf("Queue elements -> ");
  for(int i=front; i<=rear; i++)
    {
      printf("%d", queue[i]);
    }
  printf("\n");
}
int main()
 {
   int choice,value;
   printf("\n Options Available :\n");
   printf("1. EnQueue\n 2. DeQueue
             3. Display  \n 4. Exit\n");
   while(1)
      {
       printf("-----------\n");
       printf(" Enter your choice : ");
       scanf("%d", &choice);

       switch (choice)
         {
          case 1:
              printf("Enter value to insert:
              scanf("%d", &value);
              enqueue(value); break;
case 2:
        dequeue();
        break;
case 3:
        display();
        break;
case 4:
        printf("Exiting program.\n");
        return 0;
default:
        printf("Invalid choice");
    }
  }
  return 0;
}
```

Output

```
Options Available
1. EnQueue
2. DeQueue
3. Display
4. Exit
- - - - - - - - - -
Enter your choice : 3
Queue is empty
- - - - - - - - - -
Enter your choice:2
Queue Underflow
- - - - - - - - - -
Enter your choice : 1
Enter value to insert : 21
Inserted 21
- - - - - - - - - -
Enter your choice:1
Enter value to insert: 22
Inserted 22
- - - - - - - - - -
Enter your choice:1
Enter value to insert : 23
Inserted 23
- - - - - - - - - -
Enter your choice:1
Enter value to insert : 24
Inserted 24
- - - - - - - - - -
Enter your choice:1
Enter value to insert : 25
Inserted 25
- - - - - - - - - -
Enter your choice:1
Enter value to insert :26
Queue Overflow
- - - - - - - - - -
Enter your choice:2
Deleted 21
- - - - - - - - - -
Enter your choice : 3
Queue element : 23 24 25
- - - - - - - - - -
Enter your choice : 4
Exiting Program
```

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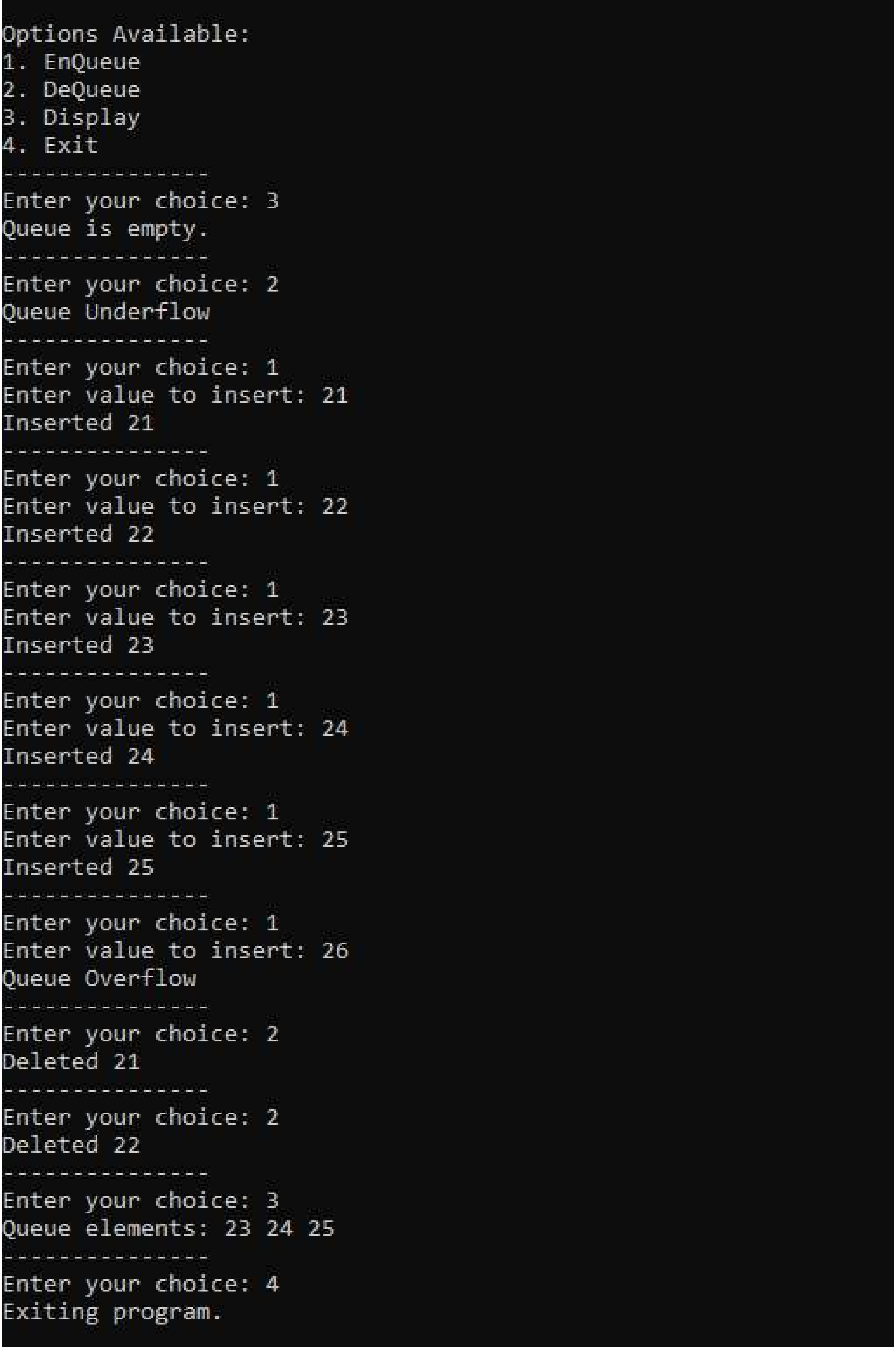

```
Options Available:
1. EnQueue
2. DeQueue
3. Display
4. Exit
---------------
Enter your choice: 3
Queue is empty.
---------------
Enter your choice: 2
Queue Underflow
---------------
Enter your choice: 1
Enter value to insert: 21
Inserted 21
---------------
Enter your choice: 1
Enter value to insert: 22
Inserted 22
---------------
Enter your choice: 1
Enter value to insert: 23
Inserted 23
---------------
Enter your choice: 1
Enter value to insert: 24
Inserted 24
---------------
Enter your choice: 1
Enter value to insert: 25
Inserted 25
---------------
Enter your choice: 1
Enter value to insert: 26
Queue Overflow
---------------
Enter your choice: 2
Deleted 21
---------------
Enter your choice: 2
Deleted 22
---------------
Enter your choice: 3
Queue elements: 23 24 25
---------------
Enter your choice: 4
Exiting program.
```