Lab Program 4:

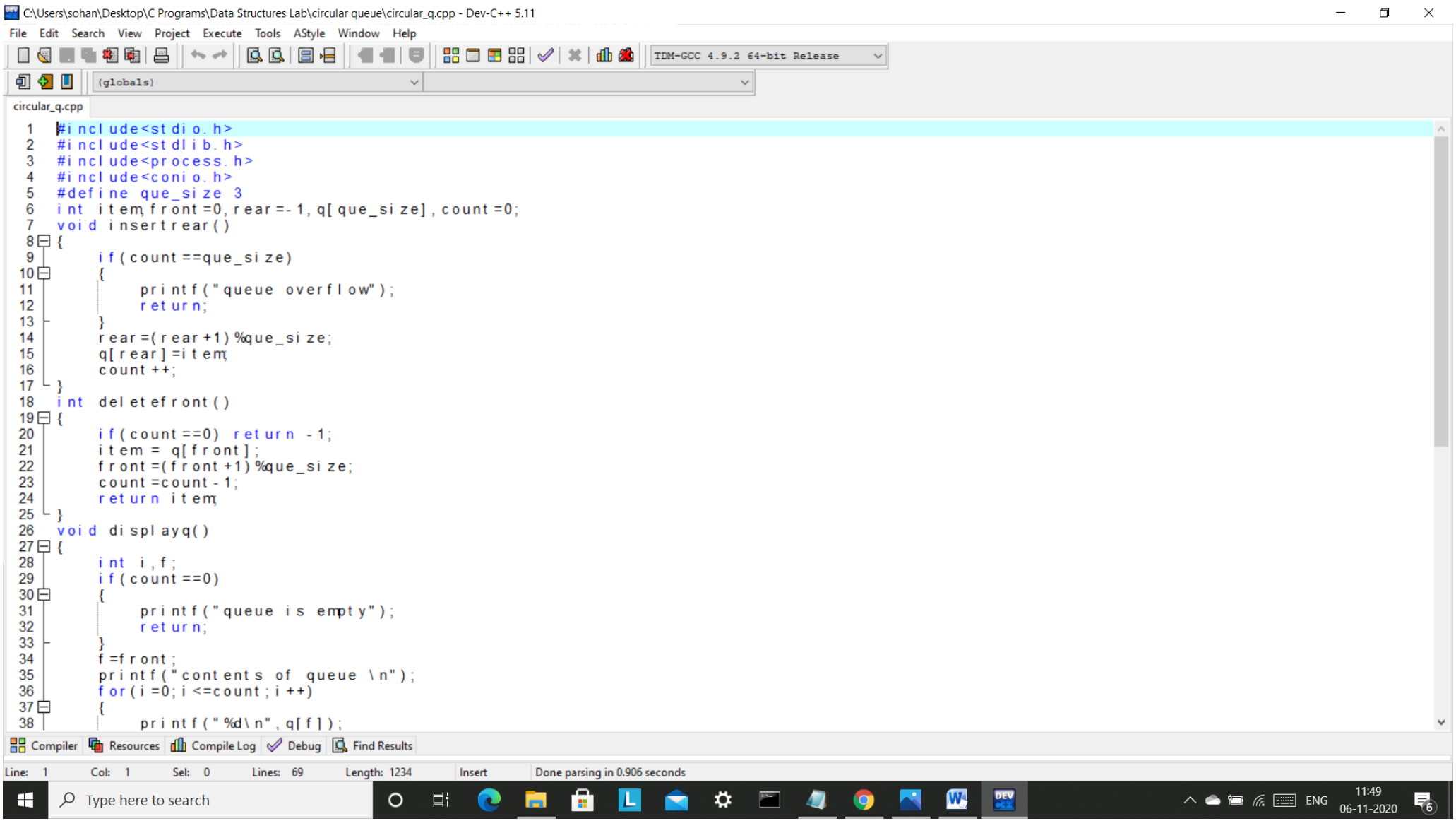
Q) Write a program to simulate the working of a circular queue of integers using an array. Provide the following operations.
a) Insert & Delete c) Display.
The program should print appropriate messages for queue empty and queue overflow conditions.

A)
```
#include<stdio.h>
#include<stdlib.h>
#include<process.h>
#include<conio.h>
#define que_size 3
int item, front=0, rear=-1, q[que_size], count=0;
void insertrear(){
if(count==que_size){
printf("queue overflow");
return;
}
rear=(rear+1)%queue_size;
q[rear]=item;
count++;
}
int deletefront(){
if(count==0) return -1;
item=q[front];
front=(front+1)%que_size;
count=count-1;
return item;
}
void displayq(){
int i,f;
if(count==0){
printf("queue is empty");
return;
}
```

```
f = front;
printf("contents of queue \n");
for(i=0; i<=count; i++){
printf("%d \n", q[f]);
f = (f+1) % que_size;
}}

int main(){
int choice;
for(;;){
printf("\n 1. insert rear \n 2. delete front \n 3. display \n
        4. exit \n");
printf("Enter the choice : ");
scanf("%d", &choice);
switch(choice){
case 1: printf("Enter the item to be inserted : ");
        Scanf("%d ", &item);
        insertrear();
        break;
case 2: item = deletefront();
        if(item == -1)
        printf("queue is empty \n");
        else
        printf("item deleted is %d \n", item);
        break;
case 3: displayq();
        break;
default: exit(0);
}}

getch();
return 0;
}
```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TDM-GCC 4.9.2 64-bit Release
(globals)
circular_q.cpp
#include<stdio.h>
#include<stdlib.h>
#include<process.h>
#include<conio.h>
#define que_size 3
int item,front=0,rear=-1,q[que_size],count=0;
void insertrear()
{
if(count==que_size)
{
printf("queue overflow");
return;
}
rear=(rear+1)%que_size;
q[rear]=item;
count++;
}
int deletefront()
{
if(count==0) return -1;
item = q[front];
front=(front+1)%que_size;
count=count-1;
return item;
}
void displayq()
{
int i,f;
if(count==0)
{
printf("queue is empty");
return;
}
f=front;
printf("contents of queue \n");
for(i=0;i<=count;i++)
{
printf("%d\n",q[f]);
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(globals)

circular_q.cpp

```
33      }
34      f=front;
35      printf("contents of queue \n");
36      for(i=0;i<=count;i++)
37      {
38          printf("%d\n",q[f]);
39          f=(f+1)%que_size;
40      }
41  }
42  int main()
43  {
44      int choice;
45      for(;;)
46      {
47          printf("\n1.Insert rear \n2.Delete front \n3.Display \n4.exit \n ");
48          printf("Enter the choice : ");
49          scanf("%d",&choice);
50          switch(choice)
51          {
52              case 1:printf("Enter the item to be inserted :");
53                     scanf("%d",&item);
54                     insertrear();
55                     break;
56              case 2:item=deletefront();
57                     if(item==-1)
58                     printf("queue is empty\n");
59                     else
60                     printf("item deleted is %d \n",item);
61                     break;
62              case 3:displayq();
63                     break;
64              default:exit(0);
65          }
66      }
67      getch();
68      return 0;
69  }
```

Compiler Resources Compile Log Debug Find Results

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C:\Users\sohan\Desktop\C Programs\Data Structures Lab\circular queue\circular_q.exe

```
1.Insert rear
2.Delete front
3.Display
4.exit
 Enter the choice : 1
Enter the item to be inserted :34

1.Insert rear
2.Delete front
3.Display
4.exit
 Enter the choice : 1
Enter the item to be inserted :23

1.Insert rear
2.Delete front
3.Display
4.exit
 Enter the choice : 1
Enter the item to be inserted :6

1.Insert rear
2.Delete front
3.Display
4.exit
 Enter the choice : 2
item deleted is 34

1.Insert rear
2.Delete front
3.Display
4.exit
 Enter the choice : 3
contents of queue
23
6
34

1.Insert rear
2.Delete front
3.Display
4.exit
 Enter the choice : 4

--------------------------------
Process exited after 39.08 seconds with return value 0
Press any key to continue . . .
```