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Circular Queue Operations:

```
#include <stdio.h>

#define MAX 5

int queue[MAX];

int front = -1, rear = -1;

void insert();

int delete_element();

int peek();

void display();

int main()

{

   int option, val;

   do

   {

      printf("Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit : \n");

       printf("Enter your option : \n");

       scanf("%d", &option);

       switch (option)

       {

       case 1:

           insert();

           break;
```

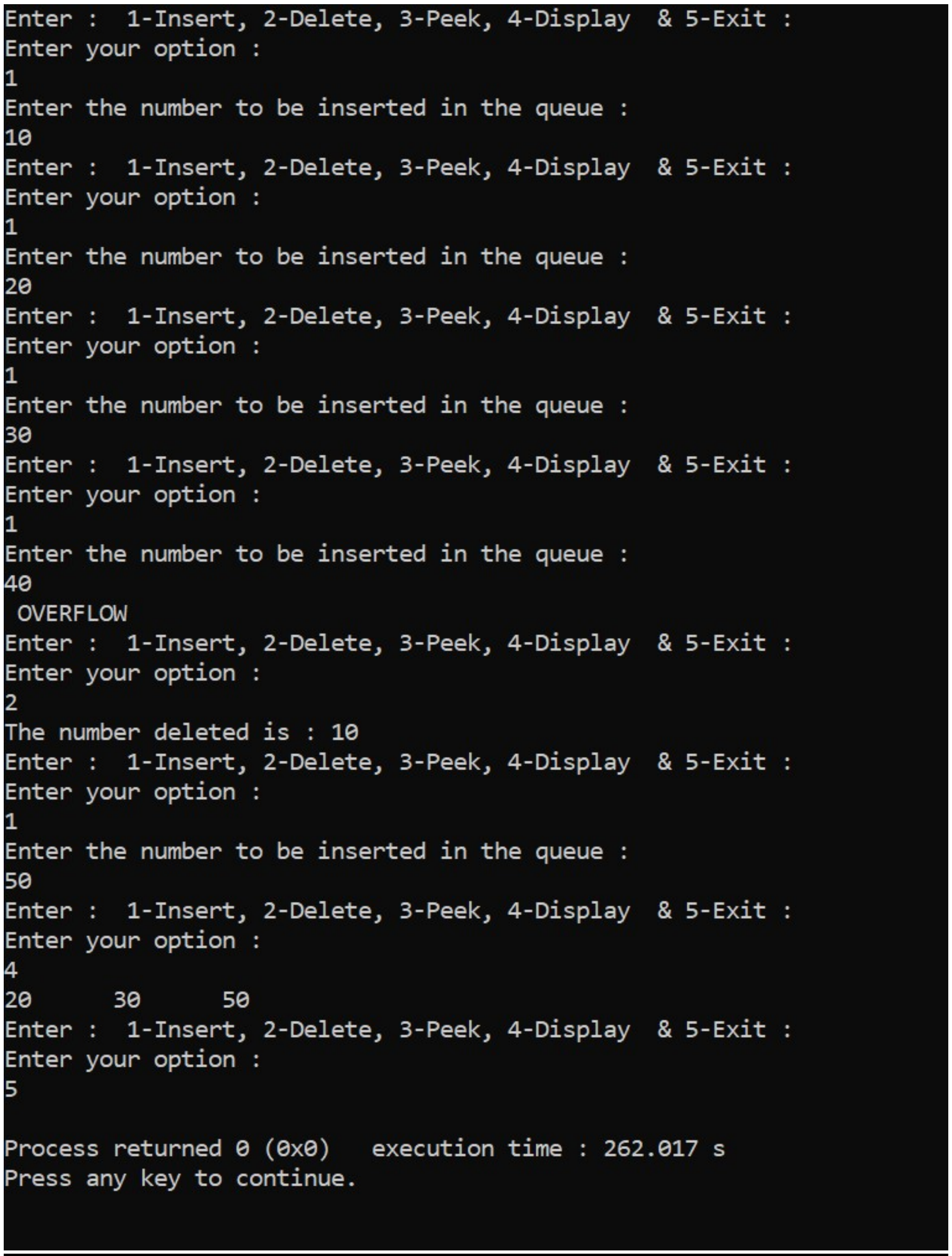
```
        case 2:
            val = delete_element();
            if (val != -1)
                printf("The number deleted is : %d \n", val);
            break;
        case 3:
            val = peek();
            if (val != -1)
                printf("\n The first value in queue is : %d \n", val);
            break;
        case 4:
            display();
            break;
        }
    } while (option != 5);
    return 0;
}

void insert()
{
    int num;
    printf("Enter the number to be inserted in the queue : \n");
    scanf("%d", &num);
    if (front == 0 && rear == MAX - 1)
```

```
        printf(" OVERFLOW \n");
    else if (front == -1 && rear == -1)
    {
        front = rear = 0;
        queue[rear] = num;
    }
    else if (rear == MAX - 1 && front != 0)
    {
        rear = 0;
        queue[rear] = num;
    }
    else
    {
        rear++;
        queue[rear] = num;
    }
}
int delete_element()
{
    int val;
    if (front == -1 && rear == -1)
    {
        printf("UNDERFLOW \n");
        return -1;
    }
    val = queue[front];
    if (front == rear)
        front = rear = -1;
    else
    {
        if (front == MAX - 1)
            front = 0;
        else
            front++;
    }
    return val;
}
int peek()
{
    if (front == -1 && rear == -1)
    {
        printf("QUEUE IS EMPTY \n");
        return -1;
    }
    else
    {
        return queue[front];
    }
```

```
}


void display()

{

    int i;

    //printf("\n");

    if (front == -1 && rear == -1)

        printf("QUEUE IS EMPTY\n");

    else

    {

        if (front < rear)

        {

            for (i = front; i <= rear; i++)

                printf("%d\t", queue[i]);

        }

        else

        {

            for (i = front; i < MAX; i++)

                printf("%d \t", queue[i]);

            for (i = 0; i <= rear; i++)

                printf("%d \t ", queue[i]);

        }

        printf("\n");

    }
```

}

Output:



```
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
1
Enter the number to be inserted in the queue :
10
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
1
Enter the number to be inserted in the queue :
20
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
1
Enter the number to be inserted in the queue :
30
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
1
Enter the number to be inserted in the queue :
40
 OVERFLOW
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
2
The number deleted is : 10
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
1
Enter the number to be inserted in the queue :
50
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
4
20      30      50
Enter :  1-Insert, 2-Delete, 3-Peek, 4-Display  & 5-Exit :
Enter your option :
5

Process returned 0 (0x0)   execution time : 262.017 s
Press any key to continue.
```