## Program 4

WAP to simulate the working of a circular queue of integers using an array. Provide the following operations: Insert, Delete & Display.

The program should print appropriate messages for queue empty and queue overflow conditions.

## Observation:

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WAP to simulate the working of a circular auche of integers using an array. Provide the following operations: insert, Delete 4 Derplay.
                                                                 if ( front = = v rear) {
                                                                        * rear 2 11;
                                                                         * front 2-1;
   The program should prent appropriate message for
                                                                     Jam Sangalo Jon
   queue overflow condettons.
   # enclude 2stdlo holo ( 1 though) = tross.
                                                                        * front = (("front + 2) % N);
   # Enclude < stalk b. h>
   # define N5
                                 every tempo
    int 9[N];
                                                                       return temp?
   void Engaue (int Etem, Ent Break, Fint "front,
                                                                void display@ (int front, int rear, int rel){

lo (front=2.1 ff rear==-1){
                     int 909) 8000 pullanh
          2 f (( ( "rear + 1) 1.N) = 7 front) {
            parott ("Queue Overflow \n");
                                                                          printe ("Queue is empty n");
                                                                           return;
        et ( ( foots 3 3 ) ) ptracy
3 (10.00 (143) 5 (100 to 20) 000 0 3. to 2.) 500
                                                                          prenty (" (ontents of Queue: (n');
                                                                          for (int & 2 front; ?! = rear; ? = (?+1) % N) {
        rear 2 ((rear+1).1.N);
2 (rear] = 1 tem;
                                                                                printf ("1.d", 2[i]);
   ent Deque (ent * front, ent * rear, ent & (3) {
          it ( front = 2 - 1 4 + rear = 2 - 4){
                                                                  seque (2nt *foot, 20t *2021, 2nt 9(3) {
24 (*foot == -2 + f *2021== -1) {
              return-1;
         ent temp = 9 ["front];
```

## Code:

```
#include <stdio.h>
#include <stdlib.h>
#define N 5
int q[N];
void Enqueue(int item, int *rear,int *front , int q[]) {
    if (((*rear+1)%N) == *front) {
        printf("Queue Overflow \n");
        return;
    if (*front == -1)
        *front = 0;
    *rear = ((*rear + 1)%N);
    q[*rear] = item;
int Deque(int *front, int *rear, int q[]) {
    if (*front == -1 && *rear == -1) {
        return -1;
    int temp = q[*front];
    if(*front == *rear){
        *rear = -1;
        *front = -1;
    else{
        *front = ((*front+1)%N);
    return temp;
void displayQ(int front, int rear, int q[]) {
    if (front == -1 && rear == -1) {
        printf("Queue is empty \n");
        return;
    printf("Contents of Queue:\n");
    for (int i = front; i != rear; i=(i+1)%N) {
        printf("%d ", q[i]);
    printf("%d",q[rear]);
```

```
int main() {
    int choice;
    int rear = -1;
    int front = -1;
    int item;
    for (;;) {
        printf("\nMenu:\n1: Enque\n2: Deque\n3: Display\n4: Exit\n");
        printf("Enter your choice:");
        scanf("%d", &choice);
        switch (choice) {
            case 1:
                printf("Enter the item to be inserted: ");
                scanf("%d", &item);
                Enqueue(item, &rear, &front , q);
                break;
            case 2:
                item = Deque(&front, &rear, q);
                if (item == -1)
                    printf("Queue is empty\n");
                else
                    printf("Item deleted = %d \n", item);
                break;
                displayQ(front, rear, q);
                break;
            case 4:
                exit(0);
            default:
                printf("Invalid choice, please try again.\n");
    return 0;
```

## Output:

```
PS C:\Users\satis> & 'c:\Users\satis\.vscode\extensions\
tdin=Microsoft-MIEngine-In-jccpmqwv.xwf' '--stdout=Micros
d=Microsoft-MIEngine-Pid-wxivilue.dcv' '--dbgExe=C:\msys6
Menu:
2: Deque
3: Display
Enter your choice:1
Enter the item to be inserted: 1
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:1
Enter the item to be inserted: 4
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:1
Enter the item to be inserted: 6
Menu:
1: Enque
2: Deque
3: Display
Enter your choice:1
Enter the item to be inserted: 8
Menu:
1: Enque
2: Deque
3: Display
Enter your choice:3
Contents of Queue:
1 4 6 8
```

```
2: Deque
3: Display
4: Exit
Enter your choice:2
Item deleted = 1
 Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:2
Item deleted = 4
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:3
Contents of Queue:
6 8
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:1
Enter the item to be inserted: 9
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:1
Enter the item to be inserted: 3
```

```
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:1
Enter the item to be inserted: 2
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:1
Enter the item to be inserted: 5
Oueue Overflow
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice:3
Contents of Queue:
6 8 9 3 2
Menu:
1: Enque
2: Deque
3: Display
4: Exit
Enter your choice: ☐
```