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➢ Laboratory *Assignment #7*

A.IMPLEMENTATION OF CIRCULAR QUEUE OPERATIONS LIKE ENQUEUE(), DEQUEUE() AND DISPLAY() USING ARRAY.

Ans:

```
#include <stdio.h>
#include <stdlib.h>
#define MAX 5
int CQ[MAX];
int rear=-1;
int front=-1;
void enQueue(int x) {
	if((rear+1)%MAX == front) {
		printf("Queue is Full");
		return;
	}
	if(front==-1)
		front=0;
	rear = (rear+1)%MAX;
	CQ[rear] = x;
}

int deQueue(){
	int x;
	if(front==-1){
		printf("\n Queue is Empty");
		return -1;
	}
```

```
        x = CQ[front];
        if(rear==front){
                rear = front = -1;
        }
        else{
                front = (front + 1)%MAX;
        }
        return x;
}
void displayCQ() {
        int i;
        for(i=front;i!=rear;i=(i+1)%MAX){
                printf("%d ", CQ[i]);
        }
        printf("%d ", CQ[i]);
}
int main()
{
        int x, p;
        while(1){
                printf("\n Press 1 to insert an element");
                printf("\n Press 2 to delete an element");
                printf("\n Press 3 to display elements");
                printf("\n Press 4 to exit");
                printf("\n ENTER THE OPERATION : ");
                scanf("%d",&x);
                switch(x){
```

```
                case 1: printf("\n Enter an element to insert:");
                        scanf("%d",&p);
                        enQueue(p);
                        break;
                case 2: p = deQueue();
                        if(front >= -1 && p!=-1)
                            printf("\n The deleted element is %d",p);
                        break;
                case 3: displayCQ();
                        break;
                case 4: exit(0);
            }
        }
}
```

OUTPUT =>

```
Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 1

Enter an element to insert:11

Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
```

ENTER THE OPERATION : 1

Enter an element to insert:22

Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 1

Enter an element to insert:33

Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 1

Enter an element to insert:44

Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 1

Enter an element to insert:55

Press 1 to insert an element

Press 2 to delete an element

Press 3 to display elements

Press 4 to exit

ENTER THE OPERATION : 1

Enter an element to insert:66

Queue is Full

Press 1 to insert an element

Press 2 to delete an element

Press 3 to display elements

Press 4 to exit

ENTER THE OPERATION : 2

The deleted element is 11

Press 1 to insert an element

Press 2 to delete an element

Press 3 to display elements

Press 4 to exit

ENTER THE OPERATION : 2

The deleted element is 22

Press 1 to insert an element

Press 2 to delete an element

Press 3 to display elements

Press 4 to exit

ENTER THE OPERATION : 2

The deleted element is 33
Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 2

The deleted element is 44
Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 2

The deleted element is 55
Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements
Press 4 to exit
ENTER THE OPERATION : 2

Queue is Empty
Press 1 to insert an element
Press 2 to delete an element
Press 3 to display elements

```
Press 4 to exit
ENTER THE OPERATION : 4


--------------------------------
Process exited after 24.84 seconds with return value 0
Press any key to continue . . .
```

B.IMPLEMENTATION OF DOUBLE ENDED QUEUE OPERATIONS LIKE REARADD(), FRONTDEL(), REARDEL() AND FRONTADD() USING ARRAY.

Ans:

```
#include<stdio.h>
#include<conio.h>
#define MAX 5
int dq[MAX];
int front=0, rear=-1;
int choice;
void dadd_rear (int num){
        if (rear==(MAX-1)){
                printf("\n You Cannot be inserted");
                return;
        }
        rear++;
        dq[rear]=num;
}
void dadd_front (int num){
        if (front==0){
                printf ("\n You Cannot be inserted");
```

```
            return;
        }
        front--;
        dq[front] =num;
}
int ddel_front (){
        int num;
        if (front>rear){
            printf ("\n UNDER FLOW");
            return (0);
        }
        num=dq[front];
        front++;
        return num;
}
int ddel_rear(){
        int num;
        if (front>rear){
            printf ("\n UNDER FLOW");
            return (0);
        }
        num=dq[rear];
        rear--;
        return num;
}

void ddisplay(){
```

```
        int i;
        if (front<=rear){
                printf ("\n Elements of double ended queue:");
                for (i=front; i<=rear; i++)
                        printf ("%d ", dq[i]);
        }
        else
                printf ("\n Queue is empty");
                return;
}
 main (){
        int n, p;
        while(1){
                printf ("\n Press 1 to insert at the REAR end in a queue:");
                printf ("\n Press 2 to delete at the FRONT end from a
queue:");
                printf ("\n Press 3 to insert at the FRONT end in a queue:");
                printf ("\n Press 4 to delete at the REAR end from a
queue:");
                printf ("\n Press 5 to display double ended queue");
                printf ("\n Press 6 to exit");
                printf ("\n Enter your choice:");
                scanf ("%d", &n);
                switch (n){
                        case 1:
                                printf ("\n Enter the element to be inserted:");
                                scanf ("%d", &p);
                                dadd_rear(p);
```

```
                    break;
                case 2:
                    p=ddel_front ();
                    printf ("\n Deleted element is %d",p);
                    break;
                case 3:
                    printf ("\n Enter the element to be inserted:");
                    scanf ("%d",&p);
                    dadd_front(p);
                    break;
                case 4:
                    p=ddel_rear();
                    printf ("\n Deleted element is %d",p);
                    break;
                case 5:
                    ddisplay();
                    break;
                case 6: break;
                default : printf ("\n Wrong choice");
            }
        }
}
```

OUTPUT =>

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:1

Enter the element to be inserted:11

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:3

Enter the element to be inserted:22

You Cannot be inserted

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:1

Enter the element to be inserted:22

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:1

Enter the element to be inserted:33

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:1

Enter the element to be inserted:44

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:5

Elements of double ended queue:11 22 33 44

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:4

Deleted element is 44

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:2

Deleted element is 11

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:5

Elements of double ended queue:22 33

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:2

Deleted element is 22

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:5

Elements of double ended queue:33

Press 1 to insert at the REAR end in a queue:

Press 2 to delete at the FRONT end from a queue:

Press 3 to insert at the FRONT end in a queue:

Press 4 to delete at the REAR end from a queue:

Press 5 to display double ended queue

Press 6 to exit

Enter your choice:6

```
--------------------------------

Process exited after 16.84 seconds with return value 0

Press any key to continue . . .
```