EXP NO:02 **IMPLEMENTATION OF STACKS AND QUEUES USING ARRAYS** **DATE:**

AIM : TO IMPLEMENT STACKS AND QUEUES USING ARRAYS.

A] MENU DRIVEN PROGRAM TO PERFORM OPERATIONS SUCH AS

I)PUSH AN ELEMENT IN A STACK

II)POP AN ELEMENT FROM STACK

Code:

```
#include <stdio.h>
#include <conio.h>
#define MAX 3
int stack[MAX],tos=-1;

void push()
{
	int num;
	if (tos==MAX-1)
	{
		printf("\nStack Overflow\n");
		return;
	}
	printf("\nEnter data: ");
	scanf("%d",&num);
	tos++;
	stack[tos]=num;
}
void pop()
{
	int num;

	if(tos==-1)
	{
		printf("\nStack Underflow\n");
		return;
	}
	num=stack[tos];
	tos--;
	printf("The number deleted is %d ",num);
}
void display()
{
	for(int i=0;i<=tos;i++)
	{
		printf("%d\t",stack[i]);
	}
}
int main()
{
int o;
	int con;
	do
	{
		printf("\nEnter 1 to push a element in a stack\nEnter 2 to  pop an
element in a stack\n");
	scanf("%d",&o);
```

```
        switch(o)
        {
        case 1:push();
               display();
               break;
        case 2 : pop();
               display();
               break;

        default: printf("\nWrong choice");
               break;
        }
        printf("\nDo you want to continue(1/0)? ");
        scanf("%d",&con);
        }
        while(con==1);
        getch();
        return 0;
}
```

Output:

Enter 1 to push a element in a stack

Enter 2 to pop an element in a stack

1

Enter data: 1

1

Do you want to continue(1/0)? 1

Enter 1 to push a element in a stack

Enter 2 to pop an element in a stack

1

Enter data: 2

1 2

Do you want to continue(1/0)? 1

Enter 1 to push a element in a stack

Enter 2 to pop an element in a stack

1

Stack Overflow

1 2

Do you want to continue(1/0)? 1

Enter 1 to push a element in a stack

Enter 2 to pop an element in a stack

2

The number deleted is 2

1

Do you want to continue(1/0)? 1

Enter 1 to push a element in a stack

Enter 2 to pop an element in a stack

2

The number deleted is 1

Do you want to continue(1/0)? 1

Enter 1 to push a element in a stack

Enter 2 to pop an element in a stack

2

Stack Underflow

Do you want to continue(1/0)? 0

B] MENU DRIVEN PROGRAM TO PERFORM OPERATIONS SUCH AS

I]INSERT AN ELEMENT IN QUEUE

II]ENTER 2 TO DELETE AN ELEMENT IN A QUEUE

Code:

```
#include <stdio.h>

#include <conio,h>

#define MAX 5

void addq(int *arr,int a,int *pfront,int *prear)
{
if(*prear==MAX-1)
{
printf("\nQueue Overflow");
return;
}
if(*prear==-1)
{
*pfront = 0;
}
(*prear)++;
*(arr+*prear)=a;
}
void delq(int *p,int *pfront,int *prear)
{
if(*pfront==-1)
{
printf("\nQueue Underflow");
return;
}
int item=*(p+*pfront);
*(p+*pfront)=0;
(*pfront)++;
printf("\nThe item deleted is %d\n",item);
if(*pfront==*prear)
{
*pfront=*prear=-1;
}

}
void display(int *p)
{
for(int i=0;i<MAX;i++)
{
printf("%d\t",*(p+i));
```

```
}
}

int main()
{
int arr[MAX],front=-1,rear=-1,num,*p;
p=&arr[0];
int o;
int con;
do
{
printf("\nEnter 1 to insert an element in queue\nEnter 2 to delete an element in a
queue\n");
scanf("%d",&o);
switch(o)
{
case 1:
{
printf("\nEnter data: ");
scanf("%d",&num);
addq(p,num,&front,&rear);
display(p);
break;
}
case 2 : delq(p,&front,&rear);
display(p);
break;
default: printf("\nWrong choice");
break;
}
printf("\nDo you want to continue(1/0)? ");
scanf("%d",&con);
}
while(con==1);
getch();
return 0;
}
```

Output:

Enter 1 to insert an element in queue

Enter 2 to delete an element in a queue

1

Enter data: 12

12

Do you want to continue(1/0)? 1

Enter 1 to insert an element in queue

Enter 2 to delete an element in a queue

1

Enter data: 23

12 23

Do you want to continue(1/0)? 1

Enter 1 to insert an element in queue

Enter 2 to delete an element in a queue

1

Enter data: 3

Queue Overflow12 23

Do you want to continue(1/0)? 1

Enter 1 to insert an element in queue

Enter 2 to delete an element in a queue

2

The item deleted is 12

23

Do you want to continue(1/0)? 1

Enter 1 to insert an element in queue

Enter 2 to delete an element in a queue

2

The item deleted is 23

Do you want to continue(1/0)? 0