

Date:15.09.22

Program 6: To perform stack operations

(a.) Push

(b.) Pop

Code:

```
#include<stdio.h>

#include<stdlib.h>

#define max 5

int a[max],top=-1;

void push(int n)
{
    if(top==max-1)
        printf("\n OverFlow");
    else
    {
        top++;
        a[top]=n;
    }
}

void pop()
{
    int del;
    if(top== -1)
        printf("\n Underflow \t");
    else
    {
        del=a[top];
        printf("\n Deleting \t %d",del);
```

```

        top--;
    }
}

void Displaying_elements()
{
    int i;
    if(top== -1)
        puts("stack is empty");
    else
    {
        for(i=top; i>=0; i--)
            printf("\t%d", a[i]);
    }
}

int main()
{
    int choice, n;
    do
    {
        printf("\n 1.Push");
        printf("\n 2.Pop");
        printf("\n 3.Display");
        printf("\n Enter Choice \t");
        scanf("%d", &choice);
        switch(choice)
        {
            case 1:
                printf("enter the element to push:");
                scanf("%d", &n);

```

```

                push(n);
                break;
            case 2:
                pop();
                break;
            case 3:
                Displaying_elements();
                break;
            case 4:
                exit(0);
                break;
        }
    }while(1);
    return 0;
}

```

Output:

```

Enter Choice  1
enter the element to push:2

1.Push
2.Pop
3.Display
Enter Choice  1
enter the element to push:3

1.Push
2.Pop
3.Display
Enter Choice  1
enter the element to push:5

1.Push
2.Pop
3.Display
Enter Choice  2

Deleting      5
1.Push
2.Pop
3.Display
Enter Choice  3
      3      2

```

Program 7: To perform Tower of Hanoi using stack operations

Code:

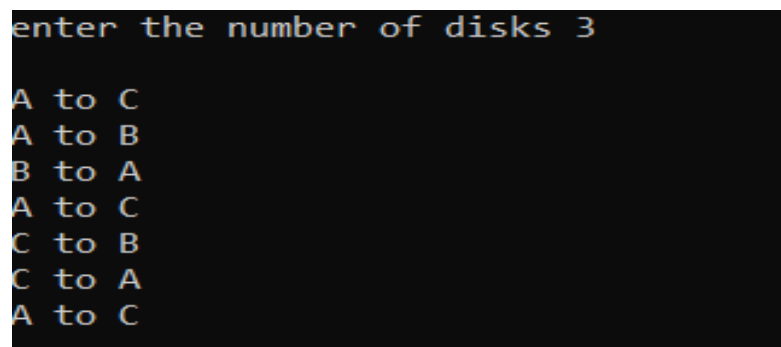
```
#include<stdio.h>

void TOHanoi(int n,char x,char y,char z)
{
    if(n==1)
        printf("\n%c to %c", x,z);

    if(n>1)
    {
        TOHanoi(n-1,x,z,y);
        printf("\n%c to %c",x,z);
        TOHanoi(n-1,z,y,x);
    }
}

int main()
{
    int n;
    printf("enter the number of disks ");
    scanf("%d",&n);
    TOHanoi(n,'A','B','C');
}
```

Output:



```
enter the number of disks 3
A to C
A to B
B to A
A to C
C to B
C to A
A to C
```

Program 8: To perform queue operations

(a.) Rear (Insertion)

(b.) Front (Deletion)

Code:

```
#include<stdio.h>
#include<stdlib.h>
#define SIZE 5
int front=-1;
int rear=-1;
int a[SIZE];
void rear_of_queue();
void front_of_queue();
void display();
int main()
{
    int choice;
    do
    {
        printf("\n 1. Insert");
        printf("\n 2. Delete");
        printf("\n 3. Display ");
        printf("\n 4. Exit");
        printf("\n Enter Your Choice:");
        scanf("%d",&choice);
        switch(choice)
        {
            case 1:
                rear_of_queue();
                break;
```

```

        case 2:
            front_of_queue();
            break;
        case 3:
            display();
            break;
        case 4:
            printf("wrong choice");
            exit(0);
    }
}while(choice!=4);
}

void rear_of_queue()
{
    int no;
    printf("\n Enter No.:");
    scanf("%d",&no);
    if(rear < SIZE-1)
    {
        a[++rear]=no;
        if(front== -1)
            front=0;
    }
    else
    {
        printf("\n Queue overflow");
    }
}

void front_of_queue()

```

```

{
    if(front==-1)
    {
        printf("\nQueue Underflow");
        return;
    }
    else
    {
        printf("\nDeleted Item:%d\n",a[front]);
    }
    if(front==rear)
    {
        front=-1;
        rear=-1;
    }
    else
    {
        front=front+1;
    }
}

void display()
{
    int i;
    if(front==-1)
    {
        printf("\nQueue is empty....");
        return;
    }
    for(i=front;i<=rear;i++)

```

```
        printf("\t%d",a[i]);  
    }  
}
```

Output:

```
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter Your Choice:1  
  
Enter No.:2  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter Your Choice:1  
  
Enter No.:3  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter Your Choice:1  
  
Enter No.:4  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter Your Choice:2  
  
Deleted Item:2  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter Your Choice:3  
      3      4  
  
1. Insert  
2. Delete  
3. Display  
4. Exit
```