NAME :VETRISELVI M

REG NO: 230701379

EX 4: Implementation of stack using array and linked list

Stack using array

#include <stdio.h>

#include <stdlib.h>

#define Size 25

int Stack[Size];

int Top=-1;

void Push(int);

int Pop();

void Display();

int IsFull();

int IsEmpty();

int Peak();

int IsFull(){

if (Top==Size-1)

return 1;

else

return 0;

}

int IsEmpty(){

if (Top==-1)

return 1;

else

return 0;

}

void Push(int val){

if (!IsFull())

{

Top=Top+1;

Stack[Top]=val;

}

else

{

printf("Stack Overflow");

}

}

int Pop(){

if (!IsEmpty()){

int del=Stack[Top];

Top=Top-1;

return del;

}

else

{

printf("Stack Underflow");

return -1;

}

}

void Display(){

int a=Top;

if (!IsEmpty()){

for (int i=a;i>=0;i--)

printf("%d ",Stack[i]);

}

else

{

printf("Stack Underflow");

return ;

}

}

int Peak(){

if (!IsEmpty())

return Stack[Top];

else

{

printf("Stack Underflow");

return -1 ;

}

}

int main(){

int choice,t=1,n;

while (t==1)

{

printf("\n\nMENU FOR STACK IMPLEMENTATION USING ARRAY:");

printf("\n1.Push an element.\n2.Pop an element.\n3.Return Top most element.\n4.Display.\n5.EXIT\n");

printf("\nEnter your choice:");

scanf("%d",&choice);

switch (choice)

{

case 1:

printf("Enter an element:");

scanf("%d",&n);

Push(n);

break;

case 2:

{

n=Pop();

printf("%d",n);

break;

}

case 3:

{

printf("%d",Peak());

break;

}

case 4:

{

Display();

break;

}

case 5:

{

t=0;

break;

}

default:

{

printf("INVALID CHOICE");

break;

}

}

}

}

Stack using linked list

#include<stdio.h>

#include<stdlib.h>

struct node

{

int data;

struct node \*link;

}\*first=NULL;

void push(int);

void pop();

void Top();

void display1();

void push(int data)

{

struct node \*newnode;

newnode=(struct node\*)malloc(sizeof(struct node));

newnode->data=data;

if(first==NULL){

newnode->link=NULL;

first=newnode;

}

else

{

newnode->link=first;

first=newnode;

}

printf("Data inserted\n");

}

void pop()

{

struct node \*temp=NULL;

temp=first;

if(first==NULL){

printf("INVALID OPERATION");

}

else{

printf("\n%d is the popped element",temp->data);

first=temp->link;

free(temp);

temp=NULL;

}

}

void Top()

{

if(first!=NULL)

printf("%d is the top element",first->data);

else

printf("\nNo data inside");

}

void display1()

{

{

struct node \*temp=NULL;

temp=first;

if(temp!=NULL){

while(temp!=NULL)

{

printf("%d ",temp->data);

temp=temp->link;

}

}

else{

printf("\nNo data inside");

}

}

}

int main()

{

int ch,n;

printf("MENU DRIVEN PROGRAM");

printf("0. Exit\n");

printf("1. Push\n");

printf("2. Pop\n");

printf("3. Return Top element\n");

printf("4. Display\n");

while(1){

printf("\nEnter your choice : ");

scanf("%d",&ch);

switch (ch)

{

case 1:

printf("\nEnter data to push : ");

scanf("%d",&n);

push\_beg(n);

break;

case 2:

pop\_beg();

break;

case 3:

top\_elemt();

break;

case 4:

display1();

break;

default:

printf("\nMENU EXITED");

break;

}

if(ch==0){

break;

}

else{

continue;

}

printf("\nProgram exited");

}

}