**STACKS USING ARRAY**

#include<stdio.h>

using namespace std;

int arr[50];

int top=-1;

int num,n;

void push()

{

top=top+1;

printf("ENTER THE VALUE");

scanf("%d",&num);

arr[top]=num;

}

void pop()

{

top=top-1;

}

void display()

{

n=top;

while(n!=-1)

{

printf("%d ",arr[n]);

n--;

}

}

int main()

{

char ch;

int c;

do{

printf("ENTER YOUR CHOICE :");

printf("1) PUSH \n2)POP \N3)DISPLAY");

scanf("%d",&c);

switch(c)

{

case 1: push();

break;

case 2: pop();

break;

case 3: display();

break;

default: printf("WRONG CHOICE");

break;

}

printf("DO YOU WANT TO CONTINUE(Y/N)");

scanf("%s",&ch);

}

while(ch=='y'||ch=='Y');

}

**OUTPUT:**

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER THE VALUE22

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER THE VALUE66

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

66 22 DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY2

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

22 DO YOU WANT TO CONTINUE(Y/N)N

**STACKS USING LINKED LIST**

#include<stdio.h>

#include<stdlib.h>

int num;

struct node

{

int data;

struct node \*next;

};

struct node \*top=NULL;

struct node \*new\_node,\*ptr;

void push()

{

printf("ENTER DATA IN THE LIST");

scanf("%d",&num);

new\_node=(struct node\*)malloc(sizeof(struct node));

new\_node->data=num;

if(top==NULL)

{

new\_node->next=NULL;

top=new\_node;

}

else

{

ptr=top;

while(ptr->next!=NULL)

{

ptr=ptr->next;

}

ptr->next=new\_node;

new\_node->next=NULL;

}

}

void pop()

{

ptr=top;

top=top->next;

free (ptr);

}

void display()

{

ptr=top;

while(ptr!=NULL)

{

printf("%d\n",ptr->data);

ptr=ptr->next;

}

}

int main()

{

char ch;

int c;

do{

printf("ENTER YOUR CHOICE :");

printf("1) PUSH \n2)POP \N3)DISPLAY");

scanf("%d",&c);

switch(c)

{

case 1: push();

break;

case 2: pop();

break;

case 3: display();

break;

default: printf("WRONG CHOICE");

break;

}

printf("DO YOU WANT TO CONTINUE(Y/N)");

scanf("%s",&ch);

}

while(ch=='y'||ch=='Y');

}

**OUTPUT:**

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER DATA IN THE LIST4

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER DATA IN THE LIST8

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

4

8

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY2

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

8

DO YOU WANT TO CONTINUE(Y/N)N

**INFIX TO POSTFIX**

#include<stdio.h>

#include<string.h>

#include<ctype.h>

#include<conio.h>

#include<stdlib.h>

char st[100];

char infix[100],postfix[100];

int top=-1,max=100;

int prior(char op)

{

if(op=='/'||op=='\*'||op=='%')

return 1;

else if(op=='+'||op=='-')

return 0;

}

void push(char st[],char val)

{

if(top==max-1)

printf("STACK OVERFLOW ");

else

{

top++;

st[top]=val;

}

}

char pop(char st[])

{

char val='a';

if(top==-1)

printf("STACK UNDERFLOW");

else

{

val=st[top];

top--;

}

return val;

}

void post(char in[],char post[])

{ char temp;

int i=0,j=0;

strcpy(post,"");

while(in[i]!='\0')

{

if(in[i]=='(')

{

push(st,in[i]);

i++;

}

else if(in[i]==')')

{

while((top!=-1)&&(st[top]!='('))

{

post[j]=pop(st); //popping in between the parenthesis

j++;

}

if(top==-1)

{

printf("\n INCORRECT EXPRESSION ");

exit(0);

}

temp=pop(st); //popping left parenthesis

i++;

}

else if(isdigit(infix[i])||isalpha(infix[i]))

{

post[j]=in[i];

i++;

j++;

}

else if(in[i]=='+'||in[i]=='-'||in[i]=='/'||in[i]=='\*'||in[i]=='%')

{

while((top!=-1)&&(st[top]!='(') &&((prior(st[top]))>prior(in[i])))

{

post[j]=pop(st);

j++;

}

push(st,in[i]);

i++;

}

else

{

printf("INCORRECT ELEMENT IN EXPRESSION !!! ");

exit(0);

}

}

while((top!=-1)&&(st[top]!='('))

{

post[j]=pop(st);

j++;

}

post[j]='\0';

}

int main()

{

printf("ENTER AN INFIX EXPRESSION :");

gets(infix);

strcpy(postfix,"");

post(infix,postfix);

printf("THE POSTFIX EXPRESSION IS :");

puts(postfix);

getch();

}

**OUTPUT:**

ENTER AN INFIX EXPRESSION :(A+B)

THE POSTFIX EXPRESSION IS :AB+

**QUEUES USING ARRAY**

#include<stdio.h>

using namespace std;

int arr[50];

#define MAX 50

int front=-1,rear=-1;

int num,n;

void push()

{

if(rear==MAX-1)

{

printf("OVERFLOW ");

}

else if(front==-1)

{

front=rear=0;

}

else

rear++;

printf("ENTER DATA ");

scanf("%d",&num);

arr[rear]=num;

}

void pop()

{

if(front>rear||front==-1)

{

printf("UNDERFLOW ");

}

else

{

front++;

if(front>rear)

{

front=rear=-1;

}

}

}

void display()

{

int i;

if(front==-1||front>rear)

printf("STACK IS EMPTY");

else

{

for(i=front;i<=rear;i++)

{

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

}

}

}

int main()

{

char ch;

int c;

do{

printf("ENTER YOUR CHOICE :");

printf("1) PUSH \n2)POP \N3)DISPLAY");

scanf("%d",&c);

switch(c)

{

case 1: push();

break;

case 2: pop();

break;

case 3: display();

break;

default: printf("WRONG CHOICE");

break;

}

printf("DO YOU WANT TO CONTINUE(Y/N)");

scanf("%s",&ch);

}

while(ch=='y'||ch=='Y');

}

**OUTPUT:**

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER DATA 2

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER DATA 3

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

2 3 DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY2

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

3 DO YOU WANT TO CONTINUE(Y/N)N

**QUEUES USING LINKED LIST**

#include<stdio.h>

#include<stdlib.h>

int num;

struct node

{

int data;

struct node \*next;

};

struct node \*front=NULL;

struct node \*rear=NULL;

struct node \*new\_node,\*ptr;

void push()

{

printf("ENTER DATA IN THE LIST");

scanf("%d",&num);

new\_node=(struct node\*)malloc(sizeof(struct node));

new\_node->data=num;

if(front==NULL)

{

front=new\_node;

rear=new\_node;

front->next=NULL;

}

else

{

rear->next=new\_node;

rear=new\_node;

rear->next=NULL;

}

}

void pop()

{

ptr=front;

if(front==NULL)

{

printf("UNDERFLOW ");

}

else

{

front=front->next;

free(ptr);

}

}

void display()

{

ptr=front;

if(ptr==NULL)

{

printf("QUEUE IS EMPTY");

}

else

while(ptr!=rear)

{

printf("%d\n",ptr->data);

ptr=ptr->next;

}

printf("%d\n",ptr->data);

}

int main()

{

char ch;

int c;

do{

printf("ENTER YOUR CHOICE :");

printf("1) PUSH \n2)POP \N3)DISPLAY");

scanf("%d",&c);

switch(c)

{

case 1: push();

break;

case 2: pop();

break;

case 3: display();

break;

default: printf("WRONG CHOICE");

break;

}

printf("DO YOU WANT TO CONTINUE(Y/N)");

scanf("%s",&ch);

}

while(ch=='y'||ch=='Y');

}

**OUTPUT:**

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER DATA IN THE LIST33

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY1

ENTER DATA IN THE LIST88

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

33

88

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY2

DO YOU WANT TO CONTINUE(Y/N)Y

ENTER YOUR CHOICE :1) PUSH

2)POP N3)DISPLAY3

88

DO YOU WANT TO CONTINUE(Y/N)N