

Write a program to simulate the working of stack
using an array with the following
a). Push b). Pop c). Display
The program should print appropriate messages for
stack overflow, stack underflow.

classmate
Date _____
Page _____

```
#include <stdio.h>
#include <stdlib.h>
#define MAX 10
int top = -1, stack[MAX];
void push();
void pop();
void display();
int main()
{
    int ch;
    while(1)
    {
        printf("In **STACK MENU**");
        printf("\n\n1.PUSH\n2,POP\n3:DISPLAY\n4.EXIT");
        printf("\nEnter your choice (1-4): ");
        scanf("%d", &ch);
        switch(ch)
        {
            case 1: push(); break;
            case 2: pop(); break;
            case 3: display(); break;
            case 4: exit(0); break;
            default: printf("In wrong choice");
        }
    }
    void push()
    {
        if (top == MAX-1) {
            printf("Stack Overflow");
            return 0;
        }
        else {
            int data;
            printf("Enter data: ");
            scanf("%d", &data);
            stack[++top] = data;
        }
    }
    void pop()
    {
        if (top == -1) {
            printf("Stack Underflow");
            return 0;
        }
        else {
            int data = stack[top];
            stack[top] = 0;
            top--;
            printf("Popped element is %d", data);
        }
    }
    void display()
    {
        if (top == -1) {
            printf("Stack is empty");
            return 0;
        }
        else {
            int i;
            for (i = top; i >= 0; i--) {
                printf("%d ", stack[i]);
            }
            printf("\n");
        }
    }
}
```

```

int val;
if (top == MAX - 1)
{ printf ("\n STACK IS FULL"); }
else
{ printf ("\n ENTER ELEMENTS TO PUSH :");
scanf ("%d", &val);
top = top + 1;
stack [top] = val;
}
}

void pop ()
{
if (top == -1)
{ printf ("\n STACK IS EMPTY"); }
else
{ printf ("\n DELETED ELEMENT IS %d", stack [top]);
top = top - 1;
}
}

void display ()
{
int i;
if (top == -1)
{ printf ("\n STACK IS EMPTY"); }
else
{ printf ("\n STACK IS ...");
for (i = top; i >= 0; i--)
printf ("%d\n", stack [i]);
}
}

```

OUTPUT

** STACK MENU **

1. PUSH
2. POP
3. DISPLAY
4. EXIT

ENTER YOUR CHOICE (1-4) : 2

STACK IS EMPTY

** STACK MENU **

1. PUSH
2. POP
3. DISPLAY
4. EXIT

ENTER YOUR CHOICE (1-4) : 1

ENTER ELEMENTS TO PUSH : 5

** STACK MENU **

1. PUSH
2. POP
3. DISPLAY
4. EXIT

ENTER YOUR CHOICE (1-4) : 1

ENTER ELEMENTS TO PUSH : 65

** STACK MENU **

1. PUSH
2. POP
3. DISPLAY
4. EXIT

main.c

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #define MAX 10
4 int top=-1,stack[MAX];
5 void push();
6 void pop();
7 void display();
8
9 int main()
10 {
11     int ch;
12     while(1)
13     {
14         printf("\n**STACK MENU**");
15         printf("\n\n1.PUSH\n2.POP\n3.DISPLAY\n4.EXIT");
16         printf("\n\nENTER YOUR CHOICE(1-4):");
17         scanf("%d",&ch);
18
19         switch(ch)
20         {
21             case 1:push();
22                     break;
23
24             case 2: pop();
25                     break;
26             case 3: display();
27                     break;
28             case 4: exit(0);
29             default: printf("Wrong choice");
```

```
}

}

return 0;
}

void push()
{
    int val;
    if(top==MAX-1)
    { printf("\nSTACK IS FULL");
    }
    else
    { printf("\n ENTER ELEMENTS TO PUSH:");
        scanf("%d",&val);
        top=top+1;
        stack[top]=val;
    }
}

void pop()
{
    if(top==-1)
    { printf("\nSTACK IS EMPTY");
    }
    else
    { printf("\nDELETED ELEMENT IS %d",stack[top]);
        top=top-1;
    }
}

void display()
{ int i;
```

```
int i;
if(top == -1)
{ printf("\n STACK IS EMPTY");}
else
{ printf("\n STACK IS ...");
for(i=top; i>=0; i--) {
printf("%d\n", stack[i]);
}
}
```



talk +

Sign

```
► clang-7 -pt -lm -o main main.c  
► ./main
```

STACK MENU

- 1.PUSH
- 2.POP
- 3.DISPLAY
- 4.EXIT

ENTER YOUR CHOICE(1-4) :2

STACK IS EMPTY

STACK MENU

- 1.PUSH
- 2.POP
- 3.DISPLAY
- 4.EXIT

ENTER YOUR CHOICE(1-4) :3

STACK IS EMPTY

STACK MENU

- 1.PUSH
- 2.POP
- 3.DISPLAY
- 4.EXIT

ENTER YOUR CHOICE(1-4) :1

ENTER ELEMENTS TO PUSH:10

STACK MENU

ENTER YOUR CHOICE (1-4) :1

ENTER ELEMENTS TO PUSH:10

STACK MENU

- 1. PUSH
- 2. POP
- 3. DISPLAY
- 4. EXIT

ENTER YOUR CHOICE (1-4) :3

STACK IS...10

STACK MENU

- 1. PUSH
- 2. POP
- 3. DISPLAY
- 4. EXIT

ENTER YOUR CHOICE (1-4) :3

STACK IS...10

STACK MENU

- 1. PUSH
- 2. POP
- 3. DISPLAY
- 4. EXIT

ENTER YOUR CHOICE (1-4) :1