

LAB PROGRAM 1

1) 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

PROGRAM :

```
#include <stdio.h>

#include <stdlib.h>

#define N 3

void push();

void pop();

void display();

int top=-1;

int stack[N];

void main()

{

    int choice;

    printf("Enter 1:push 2:pop 3:display 4:exit\n");

    while(1)

    {
```

```
scanf("%d",&choice);

switch(choice)

{

    case 1:push();

        break;

    case 2:pop();

        break;

    case 3:display();

        break;

    case 4:exit(0);

        break;

    default:

        printf("Invalid choice\n");

}

}
```

```
void push()

{

    int x;

    if(top>=N){

        printf("Stack is full, overflow\n");

    }

    else{

        top++;

    }

}
```

```
    printf("Enter the element\n");

    scanf("%d",&x);

    stack[top]=x;

    printf("Element %d is pushed in stack\n",x);

}

}
```

```
void pop()

{

    if(top==-1){

        printf("Stack is empty, underflow\n");

    }

    else{

        int data=stack[top];

        printf("Element %d is popped from stack\n",stack[top]);

        top=top-1;

    }

}
```

```
void display()

{

    if(top<=N && top>=0){

        printf("The elements of stack are\n");

        for(int i=top;i>=0;i--){

            printf("%d\t",stack[i]);

        }

    }

}
```

```
    }  
    printf("\n");  
}  
else{  
    printf("Stack is empty\n");  
}  
}
```

OUTPUT :

Enter 1:push 2:pop 3:display 4:exit

1

Enter the element

1

Element 1 is pushed in stack

1

Enter the element

2

Element 2 is pushed in stack

1

Enter the element

3

Element 3 is pushed in stack

1

Enter the element

4

Element 4 is pushed in stack

3

The elements of stack are

4 3 2 1

1

Stack is full, overflow

2

Element 4 is popped from stack

2

Element 3 is popped from stack

2

Element 2 is popped from stack

2

Element 1 is popped from stack

2

Stack is empty, underflow

3

Stack is empty