

DS Week2:

1)Using array

```
#include<stdio.h>
#include<stdlib.h>
#define STACK_SIZE 3
int top=-1;
int s[3];
int item;
void push()
{
if(top==STACK_SIZE -1)
{
printf("Stack Overflow\n");
return;
}
top=top+1;
s[top]=item;
}
int pop()
{
if(top== -1)
return -1;
return s[top--];
}
void display()
{
int i;
if(top== -1)
{
printf("Stack is empty\n");
return;
}
printf("Contents of the stack:\n");
for(i=0;i<=top;i++)
{
printf("%d\n",s[i]);
}
}
void main()
{
int item_deleted;
int choice;
for(;;)
```

```
{  
printf("\n1.Push\n2.Pop\n3.Display\n4.Exit\n");  
printf("Enter the choice\n");  
scanf("%d",&choice);  
switch(choice)  
{  
case 1:printf("Enter the item to be inserted\n");  
scanf("%d",&item);  
push();  
break;  
case 2:item_deleted=pop();  
if(item_deleted== -1)  
printf("Stack is empty\n");  
else  
printf("Item deleted is %d\n",item_deleted);  
break;  
case 3:display();  
break;  
default:exit(0);  
}  
}  
}
```

OUTPUT:

CASE 1:Stack overflow

```
/tmp/KXQEnBZxza.o
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
2

1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
5
```

```
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
6
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
4
Stack Overflow
```

CASE 2:Stack underflow/stack empty

```
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
2
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
2
Item deleted is 2

1.Push
2.Pop
3.Display
4.Exit
Enter the choice
2
Stack is empty
```

CASE 3:Exit

```
/tmp/KXQEnBZxza.o
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
2

1.Push
2.Pop
3.Display
4.Exit
Enter the choice
4
|
```

CASE 4:Display

```
Enter the choice
1
Enter the item to be inserted
2

1.Push
2.Pop
3.Display
4.Exit
Enter the choice
1
Enter the item to be inserted
3
1.Push
2.Pop
3.Display
4.Exit
Enter the choice
3
Contents of the stack:
2
3
```

2)Using pointers

```
#include<stdio.h>
#include<stdlib.h>
#define STACK_SIZE 3
int top=-1;
void push(int item,int s[],int *top)
{
if(*top==STACK_SIZE -1)
{
printf("Stack Overflow\n");
return;
}
```

```

*top=*top+1;
s[*top]=item;
}
int pop(int s[],int *top)
{
int item_deleted;
if(*top== -1)
{
printf("Stack underflow, cannot delete\n");
return 0;
}
item_deleted=s[*top];
*top=*top-1;
return item_deleted;
}
void display(int top,int s[])
{
int i;
if(top== -1)
{
printf("Stack is empty\n");
return;
}
printf("Contents of the stack:\n");
for(i=0;i<=top;i++)
{
printf("%d\n",s[i]);
}
}
void main()
{
int item,s[3];
int item_deleted;
int choice;
for(;;)
{
printf("\n1.Push\n2.Pop\n3.Display\n4.Exit\n");
printf("Enter the choice\n");
scanf("%d",&choice);
switch(choice)
{
case 1:printf("Enter the item to be inserted\n");
scanf("%d",&item);

```

```
push(item,s,&top);  
break;  
case 2:item_deleted=pop(s,&top);  
if(item_deleted!=0)  
printf("Item deleted is %d\n",item_deleted);  
break;  
case 3:display(top,s);  
break;  
default:exit(0);  
}  
}  
}
```