# DSA Assignment: 1

## Exp 1: Implementation of Stack Data Structure using Array

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D10A  Roll No: 60

**AIM:** A Stack is an abstract data type for storage serving as a collection of elements that are inserted or removed according to the Last in First out approach. The Array based Stack implementation is studied below.

**CODE:**

```
#include <stdio.h>

void push(int a[],int*top,int x);

int pop(int a[], int*top);

void display(int a[], int top);

void main(){

   int a[100],x,i;

   int top=-1;

   int choice;

   printf("Shashwat Tripathi_D10A_60\n");

   do{

      printf("Enter your choice: \n1.Push \n2.Pop \n3.Display \n4.Exit\n");

      scanf("%d", &choice);

      switch(choice)

      {

         case 1: printf("Enter the element to be pushed:\n");

         scanf("%d", &x);

         push(a,&top,x);

         break;

         case 2: x=pop(a,&top);
```

```
            printf("The popped element is: %d\n", x);
            break;
            case 3: display(a,top);
            break;
            case 4: break;
        }
    }while(choice !=4);
}
void push(int a[],int*top,int x)
{
    int n=100;
    if(*top==n-1)
    {
        printf("The stack is full!");
    }
    else
    {
        *top=*top+1;
        a[*top]=x;
    }
}
int pop(int a[], int*top)
{
    int x;
    if(*top<0)
    {
       printf("The stack is empty!");
```

```
        return 0;
    }
    else
    {
        x=a[*top];
        *top=*top-1;
        return x;
    }
}
void display(int a[], int top)
{
    int i;
    for(i=top; i>=0; --i)
    {
        printf("%d\n", a[i]);
    }
}
```

**OUTPUT:**

C:\Windows\System32\cmd.exe - DSAexp1

```
C:\Users\shweta\Documents\Shashwat\Notepad++\DSA>DSAexp1
Shashwat Tripathi_D10A_60
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
1
Enter the element to be pushed:
45
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
1
Enter the element to be pushed:
63
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
1
Enter the element to be pushed:
30
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
3
30
63
45
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
```

C:\Windows\System32\cmd.exe

```
3.Display
4.Exit
3
30
63
45
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
2
The popped element is: 30
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
3
63
45
Enter your choice:
1.Push
2.Pop
3.Display
4.Exit
4

C:\Users\shweta\Documents\Shashwat\Notepad++\DSA>
```