

**CSE 2001 - Data Structures and Algorithms**

**LAB SHEET2**

**/\*Stack Implementation In Java Using Array**

**The stack can be implemented using an Array.**

**All the stack operations are carried out using an array.**

**The below program demonstrates the Stack implementation using an array.\*/**

**import java.util.\*;**

**//Stack class**

**class Stack**

**{**

**int top; //define top of stack**

**int maxsize = 5; //max size of the stack**

**int[] stack\_arry = new int[maxsize]; //define array that will hold stack elements**

**Stack()**

**{ //stack constructor; initially top = -1**

**top = -1;**

**}**

**boolean isEmpty() //isEmpty () method**

**{**

**return (top < 0);**

**}**

**boolean push (int val) //push () method**

**{**

**if(top == maxsize-1)**

**{**

**System.out.println("Stack Overflow !!");**

**return false;**

**}**

**else**

**{**

**top++;**

**stack\_arry[top]=val;**

**return true;**

**}**

**}**

**boolean pop () //pop () method**

**{**

**if (top == -1)**

**{**

**System.out.println("Stack Underflow !!");**

**return false;**

**}**

**else**

**{**

**System.out.println("\nItem popped: " + stack\_arry[top--]);**

**return true;**

**}**

**}**

**void display () //print the stack elements**

**{**

**System.out.println("Printing stack elements .....");**

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

**{**

**System.out.print(stack\_arry[i] + " ");**

**}**

**}**

**}**

**public class Main {**

**public static void main(String[] args) {**

**//define a stack object**

**Stack stck = new Stack();**

**System.out.println("Initial Stack Empty : " + stck.isEmpty());**

**//push elements**

**stck.push(10);**

**stck.push(20);**

**stck.push(30);**

**stck.push(40);**

**System.out.println("After Push Operation...");**

**//print the elements**

**stck.display();**

**//pop two elements from stack**

**stck.pop();**

**stck.pop();**

**System.out.println("After Pop Operation...");**

**//print the stack again**

**stck.display();**

**}**

**}**

//stack  
import java.util.Scanner;  
  
public class Main  
{  
public static void main(String[] args) {  
Scanner sc = new Scanner(System.in);  
System.out.println("Enter size");  
int size=sc.nextInt();  
int[] stack = new int[size];  
int top=-1;  
while(true){  
System.out.println("Choose operation :\n1:push()\n2:pop()\n3:peek()\n4:display()");  
int choice =sc.nextInt();  
switch(choice) {  
   case 1:  
       if(top==size-1)  
                    System.out.println("Stack Overflow");  
                else{  
                    System.out.print("Enter element:");  
                    int ele = sc.nextInt();  
                    stack[++top]=ele;  
                }  
                break;  
            case 2:  
                if(top==-1)  
                    System.out.println("Stack Underflow");  
                else  
                    top--;  
                    break;  
            case 3:  
                if(top==-1)  
                    System.out.println("Stack Underflow");  
                else  
                    System.out.println(stack[top]);  
                break;  
            case 4:  
                System.out.print("\nThe stack contents are ");  
                for(int i=top; i>-1; i--){  
                    System.out.print(stack[i] + " ");  
                }  
                break;  
}  
System.out.println("continue 1/0");  
int flag = sc.nextInt();  
if(flag==0)  
   break;  
}  
}  
}