PRESIDENCY UNIVERSITY

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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();
}
}
```