

**20MCA132 OBJECT ORIENTED**  
**PROGRAMMING LAB**

**ASSIGNMENT**

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## **Course Outcome 4(CO4)**

1. Program to create a generic stack and do push and pop operations.

### **PROGRAM**

```
import java.io.*;
import java.util.*;

public class Main{

static final int MAX=100;
int top=-1;

int[] stack=new int[MAX];

public static void main(String args[])
{
    Main s1=new Main();
    int opt, val,k=0;

    System.out.println("1. PUSH ");
    System.out.println("2. POP ");
    System.out.println("3. PEEP ");
    System.out.println("4. DISPLAY STACK ");
    System.out.println("5. EXIT ");
    do{
        System.out.println("\nEnter Your Option: ");
        Scanner s=new Scanner(System.in);
        opt=s.nextInt();

        switch(opt)
        {
            case 1: System.out.println("Enter the value to be added to the stack: ");
```

```
    val=s.nextInt();
```

```
    s1.push(val);
```

```
    break;
```

```
case 2: s1.pop();
```

```
    break;
```

```
case 3: s1.peek();
```

```
    break;
```

```
case 4: s1.display();
```

```
    break;
```

```
case 5:
```

```
    k++;
```

```
    break;
```

```
default:
```

```
    System.out.println("enter valid option");
```

```
    break;
```

```
}
```

```
}while(k<=0);
```

```
}
```

```
public void push(int val)
```

```
{
```

```
    if(top==MAX-1)
```

```
    {
```

```
        System.out.println("Stack is FULL!");
```

```
    }
```

```
else
```

```
{
```

```
    top++;
```

```
        stack[top]=val;

        System.out.println("Element added to the stack is: "+val);

        display();

    }

}

public void pop()

{

    int x;

    if(top==-1)

    {

        System.out.println("Stack is EMPTY!");

    }

    else

    {

        x=stack[top];

        System.out.println("The element deleted from the stack is: "+x);

        top--;

        display();

    }

}

public void peep()

{

    int n;

    n=stack[top];

    System.out.println("The value at the top of the stack is: "+n);

}

public void display()

{

    int i;

    if(top==-1)

        System.out.println("STACK IS EMPTY!");
```

```

else
{
    for(i=0; i<=top; i++)
        System.out.println("The elements in the stack are: "+stack[i]);
}

}

}

```

## OUTPUT

```

1. PUSH
2. POP
3. PEEP
4. DISPLAY STACK
5. EXIT

Enter Your Option:
1
Enter the value to be added to the stack:
2
Element added to the stack is: 2
The elements in the stack are: 2

Enter Your Option:
1
Enter the value to be added to the stack:
3
Element added to the stack is: 3
The elements in the stack are: 2
The elements in the stack are: 3

Enter Your Option:
3
The value at the top of the stack is: 3

Enter Your Option:
2
The element deleted from the stack is: 3
The elements in the stack are: 2

Enter Your Option:
4
The elements in the stack are: 2

Enter Your Option:

```

## 2. Using generic method Bubble sort.

# **PROGRAM**

```
import java.util.*;

class Main {

    static void bubbleSort(int array[]) {
        int size = array.length;

        for (int i = 0; i < size - 1; i++)

            for (int j = 0; j < size - i - 1; j++)

                if (array[j] > array[j + 1]) {

                    int temp = array[j];
                    array[j] = array[j + 1];
                    array[j + 1] = temp;
                }
    }

    public static void main(String args[]) {
        int n;

        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the number of elements: ");

        n=sc.nextInt();

        int[] data = new int[n];

        System.out.println("Enter the elements of the array: ");
        for(int i=0; i<n; i++)
```

```
{  
  
data[i]=sc.nextInt();  
}  
  
Main.bubbleSort(data);  
  
System.out.println("Sorted Array in Ascending Order:");  
System.out.println(Arrays.toString(data));  
}  
}
```

## OUTPUT

```
Enter the number of elements: 5  
Enter the elements of the array:  
1 5 2 6 3 7  
Sorted Array in Ascending Order:  
[1, 2, 3, 5, 6]  
  
...Program finished with exit code 0  
Press ENTER to exit console.█
```

### 3. Maintain a list of Strings Using ArrayList from Collection framework, perform builtin operations.

## **PROGRAM**

```
import java.util.*;

public class Main {

    public static void main(String args[]) {

        ArrayList<String> obj = new ArrayList<String>();

        obj.add("jobin");
        obj.add("joice");
        obj.add("julia");
        obj.add("nimisha");
        obj.add("karthika");

        System.out.println("Original ArrayList:");
        for(String str:obj)
            System.out.println(str);
        System.out.println("\n");

        obj.add(0, "sonu");
        obj.add(1, "pradeep");

        System.out.println("ArrayList after add operation:");
        for(String str:obj)
            System.out.println(str);

        System.out.println("\n");
        obj.remove("joyce");
```



```
obj.remove("karthika");
```

```
System.out.println("ArrayList after remove operation:");
```

```
for(String str:obj)
```

```
    System.out.println(str);
```

```
obj.remove(1);
```

```
System.out.println("\n");
```

```
System.out.println("set index 2 as tom:");
```

```
obj.set(2, "Tom");
```

```
System.out.println("\n");
```

```
System.out.println("index of nimisha");
```

```
int pos = obj.indexOf("nimisha");
```

```
System.out.println(pos);
```

```
System.out.println("\n");
```

```
System.out.println("check for jobin in arraylist");
```

```
System.out.println(obj.contains("jobin"));
```

```
System.out.println("\n");
```

```
System.out.println("Number of items:");
```

```
int numberofitems = obj.size();
```

```
System.out.println(numberofitems);
```

```
System.out.println("\n");
```

```
System.out.println("Final ArrayList:");
```

```
for(String str:obj)
```

```
    System.out.println(str);
```

```
}
```

```
}
```

# OUTPUT

```
Original ArrayList:
jobin
joice
julia
nimisha
karthika

ArrayList after add operation:
sonu
pradeep
jobin
joice
julia
nimisha
karthika

ArrayList after remove operation:
sonu
pradeep
jobin
julia
nimisha

set index 2 as tom:

index of nimisha
3

check for jobin in arraylist
true
```

```
Number of items:
4
```

```
Final ArrayList:
sonu
jobin
Tom
nimisha
```