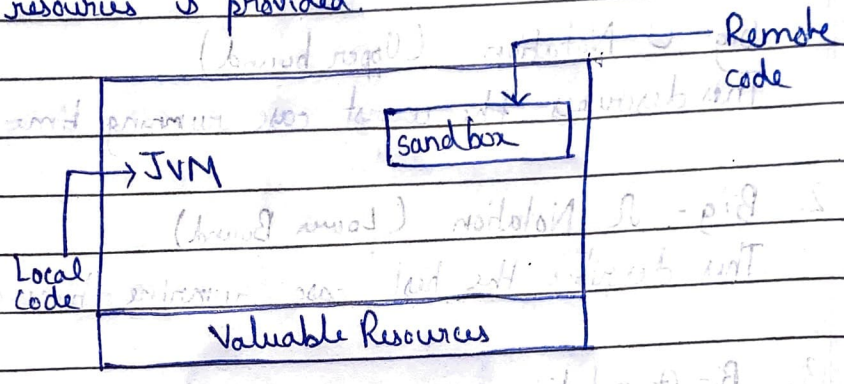
DATE: __/__/____
PAGE _____

Java Assignment - 1

Q1. Explain the sandbox Model Java?

Ans) A) In the sandbox model, the local code is trusted to have full access to vital system resources (such as file systems) while the remote downloaded code (applet) is not trusted and access to only limited resources is provided.



Sandbox is a type of software testing environment that enables the isolated execution of software or programs for independent evaluation, monitoring or testing.

1. JVM: mediates the access to crucial system resources

2. ClassLoader: defines a local name space, which can be used to ensure that an untrusted applet doesn't interfere with the working of other programs.

DATE: __/__/____
PAGE _____

B) Java Virtual Machine (JVM)

Programs written in Java are compiled into machine language but it is a machine language for a computer that doesn't really exist.

This so called 'virtual' computer is known as a Java Virtual machine. It is called an emulator because it emulates hardware, but infact is a software

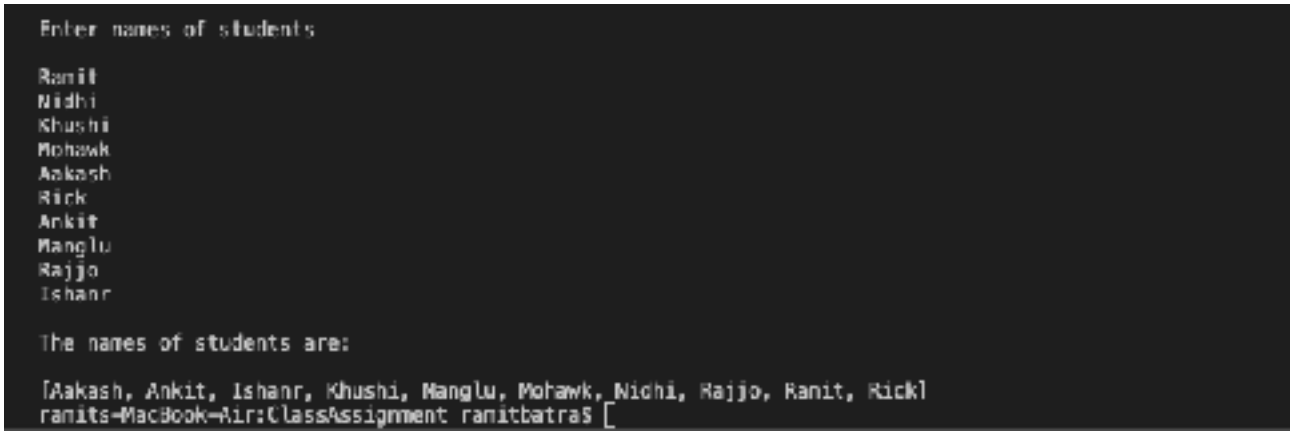
JVM also acts as an interpreter at runtime reading byte code steam and executing the instructions line to line.

Q2. Read at most 10 names of students and store them into an array of String nameOfStudents[10]. Sort the names into the lexicographic order. Display the sorted list of names.

CODE

```
import java.util.*;
class Main{
    public static void main(String[] args) {
        System.out.println("\n\nEnter names of students\n");
        int i;
        Scanner scn=new Scanner(System.in);
        String[] arr=new String[10];
        for(i=0;i<10;i++)
        {
            arr[i]=scn.nextLine();
        }

        System.out.println("\nThe names of students are:\n");
        Arrays.sort(arr);
        System.out.println(Arrays.toString(arr));
    }
}
```



Q3. Define a class Complex to represent an object for a complex number like

Z = X + i.Y with the following methods
Complex add(Complex z1, Complex z2) //To add two complex numbers Complex sub(Complex z1, Complex z2) //To subtract two complex numbers Complex mul(Complex z1, Complex z2) //To multiply two complex numbers float magnitude(Complex z) // find the modulus
Complex conjugate(Complex z) //To conjugate the complex number

CODE

```
import java.util.*;
public class Complex {
    public static void main(String[] args) {
         System.out.println("Choose any Operation");
         System.out.println("1. Add 2 complex Nos");
         System.out.println("2. Subtract 2 complex Nos");
         System.out.println("3. Multiply 2 complex Nos");
         System.out.println("4. Get Modulus/Magnitude of Complex
No");
         System.out.println("5. Get Conjugate of Complex No");
         System.out.println("6. Exit");
Scanner sc=new Scanner(System.in);
int ch=sc.nextInt();
while(ch!=6){

switch (ch) {

    case 1:
        Add();
        break;

    case 2:
    Sub();
        break;

    case 3:
        Mul();
```

```
        break;

    case 4:
        Mod();
        break;

    case 5:
        Conjugate();
        break;



    default:
    System.out.println("You entered wrong" );
        break;
}        System.out.flush();
         System.out.println("Choose any Operation");
         System.out.println("1. Add 2 complex Nos");
         System.out.println("2. Subtract 2 complex Nos");
         System.out.println("3. Multiply 2 complex Nos");
         System.out.println("4. Get Modulus/Magnitude of Complex
No");
         System.out.println("5. Get Conjugate of Complex No");
         System.out.println("6. Exit");
         ch=sc.nextInt();
}
    }



    static void Add(){
    System.out.println("Enter the 2 nos");
    Scanner s=new Scanner(System.in);
    System.out.println("Enter the real and imaginary part of no
1");
    int X1=s.nextInt();
    int Y1=s.nextInt();
    System.out.println("Enter the real and imaginary part of no
2");
    int X2=s.nextInt();
```

```
    int Y2=s.nextInt();

    System.out.println("the complex eqs are:\n1."+X1+"+"+Y1+"i.
\n2."+X2+"+"+Y2+"i.");
    int sumX=X1+X2;
    int sumY=Y1+Y2;
    System.out.println("Sum is"+sumX+"+"+sumY+"i.");

    }

    static void Sub(){
    System.out.println("Enter the 2 nos");
    Scanner s=new Scanner(System.in);
    System.out.println("Enter the real and imaginary part of no
1");
    int X1=s.nextInt();
    int Y1=s.nextInt();
    System.out.println("Enter the real and imaginary part of no
2");
    int X2=s.nextInt();
    int Y2=s.nextInt();

    System.out.println("the complex eqs are:\n1."+X1+"+"+Y1+"i.
\n2."+X2+"+"+Y2+"i.");
    int sumX=X1-X2;
    int sumY=Y1-Y2;
    System.out.println("Difference is"+sumX+"+"+sumY+"i.");

    }
    static void Mul(){
    System.out.println("Enter the 2 nos");
    Scanner s=new Scanner(System.in);
    System.out.println("Enter the real and imaginary part of no
1");
    int X1=s.nextInt();
    int Y1=s.nextInt();
    System.out.println("Enter the real and imaginary part of no
2");
    int X2=s.nextInt();
    int Y2=s.nextInt();
```

```
    System.out.println("the complex eqs are:\n1."+X1+"+"+Y1+"i.
\n2."+X2+"+"+Y2+"i.");
    int sumX=X1*X2+(-1*Y1*Y2);
    int sumY=X1*Y2+X2*Y1;
    System.out.println("Product is"+sumX+"+"+sumY+"i.");

    }

    static void Mod(){
    System.out.println("Enter the no");
    Scanner s=new Scanner(System.in);
    System.out.println("Enter the real and imaginary part of no
1");
    Double X1=s.nextDouble();
    Double Y1=s.nextDouble();

    System.out.println("the complex eq is:\n1."+X1+"+"+Y1+"i.");
    Double sumX=Math.sqrt((Math.pow(X1, 2)+Math.pow(Y1, 2)));

    System.out.println("Magnitude is"+sumX);

    }
    static void Conjugate(){
    System.out.println("Enter the no");
    Scanner s=new Scanner(System.in);
    System.out.println("Enter the real and imaginary part of no
1");
    int X1=s.nextInt();
    int Y1=s.nextInt();

    System.out.println("the complex eq is:\n1."+X1+Y1+"i.");


    System.out.println("Conjugate is:\n"+X1+"+"+(-1*Y1)+"i.");

    }
}
```

```
ramits-MacBook-Air:ClassAssignment ramitbatra$ cd "/Users/ramitbatra/Desktop/C++ 5th SEm/Java/ClassAssignment/" && javac Complex.java && java Complex
Choose any Operation
1. Add 2 complex Nos
2. Subtract 2 complex Nos
3. Multiply 2 complex Nos
4. Get Modulus/Magnitude of Complex No
5. Get Conjugate of Complex No
6. Exit
1
Enter the 2 nos
Enter the real and imaginary part of no 1
23
20
Enter the real and imaginary part of no 2
13
4
the complex eqs are:
1.23+20i.
2.13+4i.
Sum is36+24i.
Choose any Operation
1. Add 2 complex Nos
2. Subtract 2 complex Nos
3. Multiply 2 complex Nos
4. Get Modulus/Magnitude of Complex No
5. Get Conjugate of Complex No
6. Exit
2
Enter the 2 nos
Enter the real and imaginary part of no 1
13
2
Enter the real and imaginary part of no 2
1
1
the complex eqs are:
1.13+2i.
2.1+1i.
Difference is12+1i.
Choose any Operation
1. Add 2 complex Nos
2. Subtract 2 complex Nos
3. Multiply 2 complex Nos
4. Get Modulus/Magnitude of Complex No
5. Get Conjugate of Complex No
6. Exit
```

Q4. Add the necessary methods in the class PointCreate3

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/* Automatic initialization - concept of constructor */

class Point () { int x, y; Point (int x, int y) {
this.x = x ;
this.y = y; }
 	
printPoint() {
System.out.println("X = "+ this.x + " Y= " + this.y); }
}
class PointCreate2 {

public static void main (String args [ ]) { Point p = new Point (10, 20);
p.printPoint();
}

}

Practice the above to calculate the area and perimeter of a rectangle for the given two corner coordinates.

CODE

```
import java.util.*;
class Point  { int x, y;
Point ( int x, int y ) {
this.x = x ;
this.y = y;}

void printPoint() {
System.out.println("X = "+ this.x + " Y= " + this.y); }
}

 class pointCreate3 extends Point{
pointCreate3(int a,int b)
{super(a,b);
}
int area(){
```

```
return super.x*super.y;
}
int perimeter(){
    return 2*(super.x+super.y);
}
 }
public class AreaPer {
public static void main ( String args [ ] ) {
     pointCreate3 p = new pointCreate3 (10, 20 );
     System.out.println("perimeter of 10 and 20 is:
\n"+p.perimeter()+"\narea is:"+p.area());
}

}
```