

Lab Assignment 04



Inspiring Excellence

Course Code:	CSE111
Course Title:	Programming Language II
Topic:	OOP Basics, Instance Variable, and Instance Method
Number of Tasks:	11

[Submit all the Coding Tasks (Task 1 to 9) in the Google Form shared on buX before the next lab. Submit the Tracing Tasks (Task 10 & 11) handwritten to your Lab Instructors at the beginning of the lab]

Task 1

You are given the following “**University**” class:

```
public class University{  
    public String name;  
    public String country;  
}
```

Now write a Java **tester** class named “**UniversityTester**”.

- Write the main method and create 2 objects of **University** class and print the location of the objects and print the instance variables of the objects. Are the location of the objects the same?
- Now change the instance variables of the first object.
name = “Imperial College London”
country = “England”

Now change the instance variables of the second object.

name = “Brac University”
country = “Bangladesh”

Now check if the instance variables of both objects have changed or not and whether the instance variables of both objects are of the same value or not.

Task 2

Write the driver code of “**Test2**” class to generate the following output:

```
public class Test2{  
    public static void main(String [] args){  
        //Your code here  
    }  
}
```

Design Class	Output
<pre>public class Circle { public double radius = 5; }</pre>	<pre>Radius of the circle is 5.0 The area of the circle is 78.53981633974483 The circumference of the circle is 31.41592653589793</pre>

Task 3

Design the “**Student**” class so that the main method prints the following:

Tester Class	Output
<pre>public class Test3{ public static void main(String [] args){ Student s1 = new Student(); System.out.println("Name of the Student: "+s1.name); System.out.println("ID of the Student: "+s1.id); s1.id = 123; System.out.println("ID of the Student: "+s1.id); } }</pre>	<pre>Name of the Student: Bob ID of the Student: 1 ID of the Student: 123</pre>

Task 4

Write the code in java for the “**Vehicle**” class. The tester class and the output is given below:

Tester class	Output
<pre>public class Tester4{ public static void main(String [] args){ Vehicle car = new Vehicle(); System.out.println("Attributes of car object:"); System.out.println(car.type); System.out.println(car.wheels); System.out.println(car.color); System.out.println("====="); Vehicle bike = new Vehicle(); bike.type="Motor bike"; bike.wheels=2; bike.color="Red"; System.out.println("Attributes of bike object:"); System.out.println(bike.type); System.out.println(bike.wheels); System.out.println(bike.color); } }</pre>	<pre>Attributes of car object: Car 4 White ===== Attributes of bike object: Motor bike 2 Red</pre>

Task 5

Write the code in java for the “**Tournament**” class. The tester class and the **output** is given below:

Tester class	Output
<pre>public class Tester5{ public static void main(String [] args){ Tournament asiaCup = new Tournament(); System.out.println(asiaCup.name+" "+ asiaCup.sportsType+" "+asiaCup.numberOfTeams+" "+asiaCup.teams); System.out.println("*****"); asiaCup.name="Asia Cup"; asiaCup.sportsType="Cricket"; asiaCup.numberOfTeams=4; asiaCup.teams = new String[] {"BD","IND","PAK","SL"}; System.out.printf("%s %s Tournament is played between %d teams\n",asiaCup.name, asiaCup.sportsType, asiaCup.numberOfTeams); System.out.println("The teams are:"); for(int i=0; i<asiaCup.teams.length; i++){ System.out.println(asiaCup.teams[i]); } } }</pre>	<pre>null null 0 null ***** Asia Cup Cricket Tournament is played between 4 teams The teams are: BD IND PAK SL</pre>

Task 6

Design the “**ImaginaryNumber**” to generate the **output** given below:

Tester Class	Output
<pre>public class Tester6{ public static void main(String [] args){ ImaginaryNumber num1 = new ImaginaryNumber(); num1.printNumber(); System.out.println("1*****"); num1.realPart=3; num1.imaginaryPart=7; num1.printNumber(); System.out.println("2*****"); ImaginaryNumber num2 = new ImaginaryNumber(); num2.realPart=1; num2.imaginaryPart=9; num2.printNumber(); } }</pre>	<pre>0 + 0i 1***** 3 + 7i 2***** 1 + 9i</pre>

Task 7

Complete the “**Cat**” class so the main method produces the following output:

Test Class	Output
<pre>public class Test7{ public static void main(String [] args){ Cat c1 = new Cat(); System.out.println("====="); c1.printCat(); c1.color = "Black"; System.out.println("====="); c1.printCat(); c1.color = "Brown"; c1.action = "jumping"; System.out.println("====="); c1.printCat(); } }</pre>	<pre>===== White cat is sitting ===== Black cat is sitting ===== Brown cat is jumping</pre>

Task 8

Complete the **Bird** class so that main method produces the following **output**:

Test class	Output
<pre>public class Test8{ public static void main(String args[]) { Bird b1 = new Bird(); b1.name = "Parrot"; b1.flyUp(3); b1.makeNoise(); b1.flyDown(5); b1.flyDown(2); b1.flyDown(1); Bird b2 = new Bird(); b2.name = "Eagle"; b2.flyUp(5); b2.flyDown(5); b2.makeNoise(); } }</pre>	<pre>Parrot has flown up 3 feet. Squawk Parrot cannot fly down 5 feet. Parrot has flown down 2 feet. Parrot has flown down 1 feet and landed. Eagle has flown up 5 feet. Eagle has flown down 5 feet and landed. Squee</pre>

Task 9

Design the **CellPhone** class so that the **main** method of tester class can produce the following output:

Tester Class	Output
<pre>public class Tester9{ public static void main(String[]args){ CellPhone phone1 = new CellPhone(); phone1.printDetails(); phone1.model ="Nokia 1100"; System.out.println("1#####"); phone1.storeContact("Joy - 01834"); System.out.println("====="); phone1.printDetails(); System.out.println("2#####"); phone1.storeContact("Toya - 01334"); phone1.storeContact("Aayan - 01135"); System.out.println("====="); phone1.printDetails(); System.out.println("3#####"); phone1.storeContact("Sani - 01441"); System.out.println("====="); phone1.printDetails(); } }</pre>	<pre>Phone Model unknown Contacts Stored 0 1##### Contact Stored ===== Phone Model Nokia 1100 Contacts Stored 1 Stored Contacts: Joy - 01834 2##### Contact Stored Contact Stored ===== Phone Model Nokia 1100 Contacts Stored 3 Stored Contacts: Joy - 01834 Toya - 01334 Aayan - 01135 3##### Memory full. New contact can't be stored. ===== Phone Model Nokia 1100 Contacts Stored 3 Stored Contacts: Joy - 01834 Toya - 01334 Aayan - 01135</pre>

Task 10

Consider the following class:

```
public class Human{
    public int age;
    public double height;
}
```

Show the output of the following sequence of statements:

[illegible]

Task 11

Consider the following class:

```
public class Student{
    public String name;
    public double cgpa;
}
```

Show the output of the following sequence of statements:

[illegible]

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