



Course : Object oriented programming
Tutorial N°3 : JAVA variable scope

Exercise N1:

Give the output of the execution of the following JAVA program:

```
class Portee {
    public static void main(String[] args) {
        int x = 11, y = 22;
        System.out.println("1. x = " + x);
        System.out.println("2. y = " + y);    System.out.println();
        calculer1(x, y);
        System.out.println("5. x = " + x);
        System.out.println("6. y = " + y);    System.out.println();
        calculer2(x, y);
        System.out.println("11. x = " + x);
        System.out.println("12. y = " + y);    System.out.println();
        int[] object = {5};
        System.out.println("13. object[0] = " + object[0]);
        calculer3(object);
        System.out.println("15. object[0] = " + object[0]);
    }
    static void calculer1(int x, int y) {
        x = 878;          y++;
        System.out.println("3. x = " + x);
        System.out.println("4. y = " + y);
    }
    static void calculer2(int a, int b) {
        int x = 33;        int y = 44;
        a = 2 * x;          b = 2 * y;
        System.out.println("7. x = " + x);
        System.out.println("8. y = " + y);
        System.out.println("9. a = " + a);
        System.out.println("10. b = " + b);
    }
    static void calculer3(int[] object) {
        object[0] = 37;
        System.out.println("14. object[0] = " + object[0]);
    }
}
```

Exercise N5:

Give the output of the execution of the following JAVA program:

```
class Main {
    public static void main(String args[]) {
        final int i;
        i = 20;
        System.out.println(i);
    }
}
```

Exercise N2:

Give the output of the execution of the following JAVA program:

```
public class Test {
    static int x = 11;
    private int y = 33;
    public void method1(int x) {
        Test t = new Test();
        this.x = 22;    y = 44;
        System.out.println("Test.x: " + Test.x);    System.out.println("t.x: " + t.x);
        System.out.println("t.y: " + t.y);          System.out.println("y: " + y);
    }
    public static void main(String args[]) {
        Test t = new Test();    t.method1(5);    }    }
```

Exercise N3:

Give the output of the execution of the following JAVA programs:

```
class Test {
    public static void main(String args[]) {
        for (int x = 0; x < 4; x++) {
            System.out.println(x);
        }
        // Will produce error
        System.out.println(x);
    }
}
```

```
class Test2 {
    public static void main(String args[]) {
        int a = 5;
        for (int a = 0; a < 5; a++) {
            System.out.println(a);
        }
    }
}
```

Exercise N4:

Give the output of the execution of the following JAVA program:

// A Java program to demonstrate use of static keyword

```
class Student {
    String name;          int rollNo;
    static String cllgName; // static variable
    static int counter = 0; // static counter to set unique roll no
    public Student(String name) {    this.name = name;
                                    this.rollNo = setRollNo(); // unique rollNo assigned
    }

    // Getting unique rollNo through static counter
    static int setRollNo() {    counter++;    return counter;    }
    // Static method to set college name
    static void setCllg(String name) {    cllgName = name;    }
    // Instance method to print student info
    void getStudentInfo() {    System.out.println("name : " + this.name);
                              System.out.println("rollNo : " + this.rollNo);
                              System.out.println("cllgName : " + cllgName);
    }
}

class StaticDemo { // main class
    public static void main(String[] args) {
        // calling static method without instantiating Student class
        Student.setCllg("XYZ");
        Student s1 = new Student("Alice");
        Student s2 = new Student("Bob");
        s1.getStudentInfo();
        s2.getStudentInfo();
    }
}
```

Exercise N6:

Give the output of the execution of the following JAVA program:

```
class Base {
    public final void show() {
        System.out.println("Base::show()
called");
    }
}

class Derived extends Base {
    public void show() {
        System.out.println("Derived::show()
called");
    }
}
```

Exercise N7:

Explain the use of the keyword `final` for a variable, a method, and a class.