

## TP/TD 01 Introduction to Java programming language - Solution

### Solution of Part One (Hello world): ★☆☆☆

- 1- Write a java program to print your information as shown in cart:

```
1 public class PersonalCard {
2
3     public static void main(String args[]){
4
5         String name = "Ahmed";
6         System.out.println("My name is : "+name);
7
8         String born_date = "12-04-2002";
9         System.out.println("I was born on: " + born_date);
10
11         int age = 15;
12         System.out.println("I have " + age + " Years old" );
13
14         double weight;
15         weight = 55.5;
16         System.out.println("I weight : " + weight + "Kg");
17     }
18 }
```

- 2- Write a Java program to calculate and print the average of three numbers.

3-

```
1 public class Average {
2     public static void main(String args[]){
3         int a, b, c;
4         a = 10; b = 12; c = 11;
5         double avg = (a+b+c)/3;
6         System.out.print("The average of "+a+" and "+b+" and " + c);
7         System.out.print("is : " + avg);
8     }
9 }
```

- 4- Write a Java program to find the value of the following expression:

- a)  $(101 + 0) / 3$                       d) `false && true`  
b)  $3.0e-6 * 10000000.1$                 e) `(false && false) || (true && true)`  
c) `true && true`                            f) `(false || false) && (true && true)`

```
1 public class PartOneEx03 {
2     public static void main(String[] args) {
3         int r1 = (101 + 0) / 3;
4         double r2 = 3.0e-6 * 10000000.1;
5         boolean r3 = true && true;
6         boolean r4 = false && true;
7         boolean r5 = (false && false) || (true && true);
8         boolean r6 = (false || false) && (true && true);
9
10        System.out.println("(101 + 0) / 3)-> " + r1);
11        System.out.println("(3.0e-6 * 10000000.1)-> " + r2);
12        System.out.println("(true && true)-> " + r3);
13        System.out.println("(false && true)-> " + r4);
14        System.out.println("((false && false) || (true && true))-> " + r5);
15        System.out.println("(false || false) && (true && true)-> " + r6);
16    }
17 }
```

#### Execution

```
(101 + 0) / 3)-> 33
(3.0e-6 * 10000000.1)-> 30.0000003
(true && true)-> true
(false && true)-> false
((false && false) || (true && true))-> true
(false || false) && (true && true)-> false
```

5- Write a Java program to check whether the given number is even or odd.

```
1 public class EvenOrOdd {  
2     public static void main(String[] args) {  
3         int num = 10;  
4         if(num % 2 == 0){ System.out.println(num + " is even"); }  
5         else { System.out.println(num + " is odd"); }  
6     }  
7 }
```

6- Consider the following code snippet:

```
1 int i = 10;  
2 int n = i++%5;
```

a. What are the values of **i** and **n** after the code is executed?

➔ **Answer:** **i** is 11, and **n** is 0.

b. What are the final values of **i** and **n** if instead of using the postfix increment operator (**i++**), you use the prefix version (**++i**)?

➔ **Answer:** **i** is 11, and **n** is 1.

c. To invert the value of a **boolean**, which operator would you use?

➔ **Answer:** The logical complement operator **!**.

d. Which operator is used to compare two values, **=** or **==** ?

➔ **Answer:** The **==** operator is used for comparison, and **=** is used for assignment.

7- Explain the following code sample: **result = someCondition ? value1 : value2;**

➔ **Answer:** This code should be read as: "If **someCondition** is true, assign the value of **value1** to **result**. Otherwise, assign the value of **value2** to **result**."

8- In the following program, explain why the value "6" is printed twice in a row:

➔ **Answer:** The code **System.out.println(++i);** evaluates to 6, because the prefix version of **++** evaluates to the incremented value. The next line, **System.out.println(i++);** evaluates to the current value (6), then increments by one. So "7" doesn't get printed until the next line.

**Solution of Part Two (Flow control): ★★☆☆☆**

**Task 01:** Answer of the questions:

1. The most basic control flow statement supported by the Java programming language is the **if-then** statement.
2. The **switch** statement allows for any number of possible execution paths.
3. The **do-while** statement is similar to the while statement, but evaluates its expression at the **bottom** of the loop.
4. **Question:** How do you write an infinite loop using the for statement?

**Answer:**

```
for ( ; ; ) {  
    // code  
}
```

5. **Question:** How do you write an infinite loop using the while statement?

**Answer:**

```
while (true) {  
    // code  
}
```

**Task 02:**

1. Consider the following code snippet.

```
1  if (aNumber >= 0)  
2      if (aNumber == 0)  
3          System.out.println("first string");  
4  else System.out.println("second string");  
5  System.out.println("third string");
```

- a. What output do you think the code will produce if **aNumber** is 3?

➔ **Answer :**

```
second string  
third string
```

- b. Write a test program containing the previous code snippet; make **aNumber** 3. What is the output of the program? Is it what you predicted? Explain why the output is what it is; in other words, what is the control flow for the code snippet?

→ **Answer :**

```
second string  
third string
```

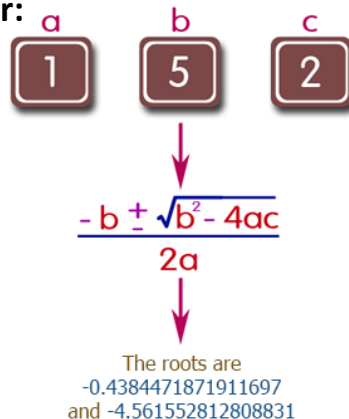
3 is greater than or equal to 0, so execution progresses to the second if statement. The second if statement's test fails because 3 is not equal to 0. Thus, the else clause executes (since it's attached to the second if statement). Thus, second string is displayed. The final println is completely outside of any if statement, so it always gets executed, and thus third string is always displayed

- c. Reformat the code snippet to make the control flow easier to understand, use braces, { and }, to further clarify the code.

```
1  if (aNumber >= 0){  
2      if (aNumber == 0){  
3          System.out.println("first string");  
4      }else{  
5          System.out.println("second string");  
6      }  
7  System.out.println("third string");  
8  }
```

2. Write a Java program to solve quadratic equations (use **if**, **else if** and **else**).

→ **Answer:**



```
1 public class QuadraticEquations {
2     public static void main(String[] Strings) {
3
4         double a = 1;
5         double b = 5;
6         double c = 2;
7
8         double result = b * b - 4.0 * a * c;
9
10        if (result > 0.0) {
11            double r1 = (-b + Math.pow(result, 0.5)) / (2.0 * a);
12            double r2 = (-b - Math.pow(result, 0.5)) / (2.0 * a);
13            System.out.println("The roots are " + r1 + " and " + r2);
14        } else if (result == 0.0) {
15            double r1 = -b / (2.0 * a);
16            System.out.println("The root is " + r1);
17        } else {
18            System.out.println("The equation has no real roots.");
19        }
20    }
21 }
```

Outputs:

```
The roots are -0.4384471871911697 and -4.561552812808831
```