

Frankfurt University of Applied Science

OOP/Java – WiSe 22/23 – Doina Logofătu

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WEEK 4 – TASK 3 – QUIZZES

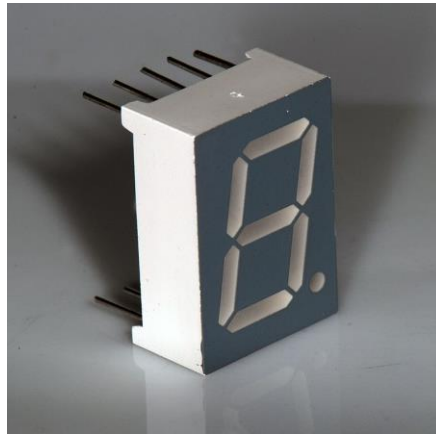
Question 1: Given the Java program below:

```
1 public class MyClass {  
2     public static void main(String args[]) {  
3         int num1 = 101;  
4         int num2 = 0b101;  
5         int num3 = 0x101;  
6         double num4 = 0e101;  
7  
8         System.out.println(num1);  
9         System.out.println(num2);  
10        System.out.println(num3);  
11        System.out.println(num4);  
12    }  
13 }
```

Which variable has the **lowest** value?

- A. num1
- B. num2
- C. num3
- D. **num4**

Question 2: Using the same program as Question 1, the highest variable (in terms of value) has its value **closest** to which number below?



Seven-segment LED display (https://commons.wikimedia.org/wiki/File:Seven_segment_01_Pengo.jpg)

- A. Number of bits in a byte
- B. Number of seven-segment display's lighting states
- C. Number of days in a year**
- D. Number of seconds in an hour

Explanation:

num1 = 101; num2 = 5 ($101_2 = 5_{10}$); num3 = 257 ($101_{16} = 257_{10}$); num4 = 0.0

In question 2, the value of:

Option A = 8; Option B = 128 ($= 2^7$); Option C = 365 (or 366); Option D = 3600

Question 3: Given the Java program below:

```
1 import java.math.BigDecimal;
2
3 public class MyClass {
4     public static void main(String args[]) {
5         System.out.println("0.1f == 0.1 is " + (0.1f == 0.1));
6         System.out.println("0.1f is actually " + new BigDecimal(0.1f));
7         System.out.println("0.1 is actually " + new BigDecimal(0.1));
8     }
9 }
```

Source: Peter Lawrey (<https://stackoverflow.com/a/9748566>)

What is the first line's output?

- A. True
- B. False
- C. `0.1f == 0.1` is true
- D. `0.1f == 0.1` is false**
- E. `0.1f == 0.1` is (`0.1f == 0.1`)
- F. Error

Explanation: The part “(`0.1f == 0.1`)” in the first line is a Boolean operation, which only returns true or false. Here, `0.1f` is the closest representation in “float” datatype, while `0.1` is the closest representation in “double” datatype. Since “float” has smaller size than “double” (4 bytes < 8 bytes), “float” is not as accurate and precise as “double”, which can be seen in the output below:

Result

CPU Time: 0.11 sec(s), Memory: 33452 kilobyte(s)

```
0.1f == 0.1 is false
0.1f is actually 0.100000001490116119384765625
0.1 is actually 0.1000000000000000055511151231257827021181583404541015625
```