

PM617: Research Development: Java Workshop Assignment

Graciela Carrillo

01/04/2020

Introduction

Welcome to the Learn “Java by Example Workshop” problem set! These problem set is an opportunity for you to practice the concepts you learned.

Learning a computer programming language is similar to learning a human language. Nobody can pick it up overnight, there’s a lot of vocabulary and syntax to remember. Language learners often speak of the moment when they realized they stopped translating in their head and actually started thinking in their second language. This will happen with Java too! Eventually, you will be able to consider a task that needs coding and immediately imagine what Java code would complete it. To get there, though, requires practice.

That’s where problem sets come in. If you decide to continue on the path of learning Java, completing exercises and mini-projects is going to help you get better at it.

There isn’t a right or wrong way to work on these. Some problems require you to examine code or do some arithmetic. I highly recommend that you pick your favorite text editor, like your NotePad, open a blank text file, and try writing out the code, before trying to see if it works on java.

For your evidence, upload your *.txt or *.java file with the answers to these questions. That will be your evidence.

All the best! - Grace C.

Question 1

Which of the following Java variable declarations has an error?

- A. `int x = 5;`
- B. `double temperature = 75.6;`
- C. `char grade = 'A';`
- D. `String name = 'Adam';`

Question 2

What value for register will be printed at the end of this block of Java code?

```
double register = 10.0;
register = register + 5; //Customer pays £5.
register = register - 2.5; //Customer receives £2.50 as change.
register = register + 10; //Customer pays £10.
register = register - 3; //Customer receives £3 as change.
System.out.println(register);
```

- A. 19.0
- B. 19.5
- C. 22.5
- D. 25.5

Question 3

Write your code: Define an integer variable called `bankBalance`. Initialize it to a value of 500. Then add 250 to it. Then subtract 100 from it. Finally, print the resulting value.

Question 4

What value will be printed by this line of Java code?

```
System.out.println(2.0 * (5 / 2));
```

- A. 4
- B. 4.0
- C. 5
- D. 5.0
- E. This line of code will give an error.

Question 5

Write Java code to define an integer variable called `day`, and a String variable called `month`. Give `month` and `day` appropriate values for your birthday.

Question 6

Write Java code to create a String variable called `firstName`, define it to be your first name as a String. Then define a variable called `lastName` and define it to be your last name as a String. Then define a variable called `fullName` and set it to be your first name followed by a space followed by your last name. Use the existing variables for your first and last name and String concatenation to define `fullName`. Finally, write code to print this text:

```
Hello, my name is [full name].  
There are [number] letters in my name.
```

Use String concatenation to create the first String to print using the `fullName` variable, and use the `.length()` command on `firstName` and `lastName` to calculate the number of letters.

Note: you can concatenate an integer and a String and the integer will be converted to a String. For example, this expression:

```
"There are " + 7 + "days in a week."
```

will be evaluated as the String:

```
"There are 7 days in a week."
```

Question 7

Write Java code to define a double variable called `fahrenheit` and set it to an initial value between 0 and 100. Then, create a double variable called `celsius`, and calculate its value based on the value of `fahrenheit`. (To convert from Fahrenheit to Celsius, subtract 32, then multiply by 5, then divide by 9.) Finally, print the final value of `celsius`.

Solution Sheet

Please only look at these once you have completed the exercises on your own. That's the only way you will learn a programming language!

Question 1 Solution

```
D. String name = 'Adam';
```

When defining Strings, we need to use double quotes around the text, like this:

```
String name = "Adam";
```

Single quotes are used for defining single characters, like this:

```
char grade = 'A';
```

Question 2 Solution

B. 19.5

The register has a starting value of 10. Then 5 is added, so the variable's new value is 15. Then 2.5 is subtracted, giving the variable a new value of 12.5. Next, 10 is added, bringing the value up to 22.5. Finally, 3 is subtracted, leaving a value of 19.5.

Question 3 Solution

Example solution code:

```
int bankBalance = 500;
bankBalance = bankBalance + 250;
bankBalance = bankBalance - 100;
System.out.println(bankBalance);
```

Question 4 Solution

B. 4.0

When evaluating the arithmetic expression $2.0 * (5 / 2)$, Java will evaluate the expression inside the parentheses, $5 / 2$. When dividing two integers, Java will ignore the remainder, so $5 / 2$ evaluates to the integer 2, not the double 2.5. This process is called truncation. The second step in evaluating the expression is evaluating $2.0 * 2$. When multiplying a double and an integer, the result is a double, so the value printed is the double 4.0.

Question 5 Solution

Example solution code:

```
int day;  
String month;  
day = 1;  
month = "January";  
  
//Note that this can be compressed into two lines by defining the  
//variables and giving them an initial value at the same time:  
int day = 1;  
  
String month = "January";
```

Question 6 Solution

Example solution code:

```
String firstName = "Grace";  
String lastName = "Carrillo";  
String fullName = firstName + " " + lastName;  
  
System.out.println("Hello, my name is " + fullName + ".");  
int lettersInName = firstName.length() + lastName.length();  
System.out.println("There are " + lettersInName  
+ " letters in my name.");
```

Question 7 Solution

Example solution code:

```
double fahrenheit = 68.0;  
double celcius;  
celcius = (fahrenheit - 32) * 5 / 9;  
System.out.println(celcius);  
//With fahrenheit having a value of 68.0, this would print 20.0.
```