Programming 1 Week 3 exercises

Create a week 3 folder in your programming1 folder if you have not already done so.

The objective of these exercises is to make you familiar with the range of primitive data types in Java and with operations — specifically, numeric operations. And to

1. Write a program which assigns the values 9 and 7 to two `int` variables, a and b, and calculates and displays their sum (a +b), difference (a - b), product (a * b), moduls `(a%b)` and quotient (a/b).

2. Repeat the previous exercise, changing the *type* of a and b to `double` and the values to 9.0 and 7.0 respectively.

3. Repeat the previous exercise, but changing the type to `float`, leaving everything else the same. What happens? Why? How can you resolve the problem? Ask the tutor if you are not sure.

4. The order of operations can make a difference to the value of an expression. Test this by writing a Java program which calculates and displays the values of the expressions: $3 + 4 \times 5$ and $3 + (4 \times 5)$ and $(3 + 4) \times 5$.

5. Write a program to input your name via a question dialog box and output the following message in a information box

Hello and welcome
Your name

6. Write a program to convert an input value in euros into pounds. You can assume that there are 1.67 euros to the pound. Use dialog boxes for both input and output. Some of the code is given below. Note that the String input needs converting to a double value before the calculation can be performed!

```
final double EUROS_TO_POUNDS = 1.67;
String euroString = JOptionPane.showInputDialog("Enter number of euros");
euros = Double.parseDouble(euroString);
pounds = euros / EUROS_TO_POUNDS;
```

7. Write a program to convert an input value in degrees Fahrenheit (of type `double`) to degrees Celsius. The formula for the conversion is:

C = 5.0/9.0*(F-32.0)

Test your program knowing 212 F = 100 C and 32 F = 0 C.

8. Write a program to compute an electricity bill. Your program should prompt the user for the number of kilowatt-hours (kwH) of electricity used, calculate the amount owed, and output a report.

The amount owed should consist of a standing charge of £5.50 together with the cost of electricity, calculated at the rate of 7 pence per kwH.

The generated report should EXACTLY follow the format below, including a blank

line prior to the “ELECTRICITY BILL” line. All capitalization, blank lines, spacing, and punctuation must appear as indicated; only the numbers should differ so as to reflect the number of kwH entered.

```
ELECTRICITY BILL
Usage:            100 kwH
Standing Charge:  5.50
Electricity Cost: 7.0
Total:            12.50
```