Lab 7 – Working with Methods

Since this is your first attempt at working with methods, here is a lab exercise in working with, designing and programming simple methods.

Part 1

Find the *BlueJ* project folder named `Lab7_Start` in the `Resource` folder (or download and decompress `Lab7_Start.zip` on Blackboard). Copy this to your home directory. Rename your copy to `Lab7_lastname_firstname`. This project contains a program which you will use for the first part of the lab.

Open the class `Part1`. This program calculates the Canadian Dollar equivalent for a given Euro amount. It uses 2 methods, a void method to print the welcome message and a value returning method that calculates and returns the Canadian dollar equivalent.

1. Take a close look at the program, paying particular attention on:
    a. How each method is defined
    b. How each method performs its function
    c. How the methods are called from the main
    d. Where each method is located
    e. How the whole program and each method is documented

2. Run the program and enter 100.0 when requested. What is the value of the Canadian equivalent?

Part 2

Case Scenario:

In a particular training course, the students are given tests at the end of each module. The number of modules is dependent on the course. These tests are marked out of a hundred. At the end of the training program, the students are given the following messages (depending on their average) on their certificate:

80 and above:	You have excelled in the course
50 and above but less than 80:	You have met the requirements of the course
below 50:	You have failed to meet the minimum requirements.

The partial algorithm is shown as follows:

main:

```
call method that reads, calculates and returns average
print average
if average < 50.0
   call method to print "fail"
else if average < 80.0
   call method to print "pass"
else
   call method to print "excellent"
```

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method: `calculateAverage` (assume grade, average and sum are doubles, count and numberModules are int)

how is the method header written?

```
sum = 0
count = 1
read numberModules
while (count <= numberModules )
   read grade
   sum = ?????
   count = ?????
average = sum / numberModules
return ?????
```

method: `printFail`

how is the method header written?

```
print "fail" message
```

method: `printPass`

how is the method header written?

```
print "pass" message
```

method: `printExcellent`

how is the method header written?

```
print "excellent" message
```

Required:

1. Complete the algorithm by filling in the ????? as well as the method headers. Write down what should replace each ????? and each method header. Once you have done so, translate the algorithm into a syntactically correct program. Call the new class `Part2`.

2. Based on the algorithm above, you will need to create one main and 4 methods: One that will read the grades and return the average and 3 that will print the proper message (as shown in the algorithm above. For the purposes of this lab, the Scanner class will be declared in the method `calculateAverage`.

3. Test your program with the following data: (perform the calculations so you will have an idea of what should be printed out). You should run your program 3 times.

	Modules	Grades	Average
Set 1	3	80, 100, 90	
Set 2	4	60, 80, 75, 65	
Set 3	2	30, 50	

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Submission:

Submit your work in the usual way.