Feuille d'exercices 1: introduction

Design Methodology

To write a program must take the following steps:

1. Determine the information needed to solve the problem.
   This is the data or program entries
2. Determine what you want to calculate.
   These are the results and outputs of the program
3. Being able to calculate yourself the outputs from sample data.
   This is a step in understanding the problem.
4. Describe how to calculate the outputs from the inputs.
5. Code in Java.

Regarding the last step, we will learn in the next exercice how to achieve it. For this first exercise, we will stop at step 4. We have not seen enough to make Java coding.
First, let as consider an example.

Example

The problem: testing whether three integers are sorted in ascending order. The answers to the first four stages of design are:
1. Inputs: 3 integers that we call (a), (b) and (c)
2. Output: the answer to the problem is likely Boolean property true (the value calculated by the program will be true) or false. In summary, the program will output a boolean which we call (br)
3. Here are some examples:
a = 6, b = 10, c = 45:
a = 6, b = 7, c = 4:
a = 6, b = 3, c = 2:

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4. If a <b and b <c then cr=true otherwise false
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Exercise 1.1

Do steps 1, 2 and 3 and 4 for each of the following problems:

1. Calculate the final grade for a unit of teaching knowing that:
A score below 7 examination is disqualifying.
If the exam score is higher than 7, the final score is the average of the two marks if it benefits the student. Otherwise, the final grade is the exam score.

2. Test whether an integer belongs to the interval given by two integers.

3. Test whether a leap year. We know that a year divisible by 4 is a leap year unless it is divisible by 100, however, years divisible by 400 are also leap years.

Exercise 1.2

First program (class) in Java:

Method 1:
Preparation of laboratory:
download and install Eclipse
create a project with a single class (application): **Hello.java**

Method 2: mobile access point to Raspberry-Pi server
Via WiFi you connect to the access point AP.
Then in your teminal run ssh command (or equivalent) log on:
s1@192.168.1.10 and s2@192.168.1.10, ..., et8@192.168.1.10,
at student's account.
It should create a directory in which it will MyClasses write programs (classes) Java.
The edition may be done with: **vi** ClassName.java
The compilation is done by: **javac** ClassName.java
Execution by: **java** ClassName