Assignment 1: Getting Started

Problems?

Do not hesitate to ask your teaching assistant at the practical meetings (or Jonas at the lectures) if you have any problems. You can also post a question in the assignment forum in Moodle.

Exercises

Lecture 1 (Getting Started)

1. **Install Java**
   Download and install Java SE JDK: www.oracle.com/technetwork/java/javase/downloads. Also, there are plenty of instruction videos available in YouTube. Just search for "Install Java X" where X is your operating system.

2. **Install Eclipse**
   Download and install Eclipse IDE for Java Developers: http://www.eclipse.org/downloads/. Once again, there are plenty of instruction videos available in YouTube. Just search for "Install Eclipse X" where X is your operating system.

3. **Setup Eclipse Workspace**
   Before you start programming, do the following.
   - Create an Eclipse *workspace* (a folder) with the name `java_courses` on some location in your home directory.
   - Create a *Java project* with the name `1DV506` inside the workspace.
   - Create a *package* with the name `YourLnuUserName_assign1` inside the project. For example, it might look something like `wo222ab_assign1`.
   - Save all program files from the exercises in this assignment inside the package `YourLnuUserName_assign1`.
   - In the future: create a new package (`YourLnuUserName_assignX`) for each assignment and a new project (with the course code as name) for each new course using Java.

4. **Edit, compile and execute.**
   Create, compile and execute the following program inside your assignment 1 package:

```
/* The classical "Hello World!" program. */
public class Hello {

    public static void main(String[] args) {
       System.out.println("Hello World!"); // Print
    }
}
```

Lecture 2 - (Input/Output, Operations on Primitive Types)

5. **Printing**
   Write a program `Print.java`, which will print the phrase *Knowledge is power!*
   - on one line,
   - on three lines, one word on each line,
   - inside a rectangle made up by the characters = and |.

6. **Quote**
   Write a program `Quote.java` which reads a line of text (using class `Scanner`) and then prints the same line as a quote (that is inside `" "`). An example of an execution:

```
Write a line of text:  I wish I was a punk rocker with flowers in my hair.
Quote: "I wish I was a punk rocker with flowers in my hair."
```

7. **Number of seconds**
   Write a program `Seconds.java` which reads three integers (hours, minutes, seconds) and then computes the corresponding time measured in seconds. For example, 1 hour, 28 minutes and 42 seconds is equal to 5322 seconds. An example of an execution:

```
Hours: 1
Minutes: 28
Seconds: 42

Total time measured in seconds: 5322
```

8. **BMI**
   Write a program `BMI.java` which computes the BMI (Body Mass Index) for a person. The program will read length and weight from the keyboard and then present the result as output. The BMI is computed as weight/(length)^2, where the length is given in meters and the weight in kilograms. An example of an execution:

```
Give your length in meters: 1,83
Give your weight in kilograms: 83
Your BMI is: 25
```

   Note: the BMI is always an integer.

9. **Time**
   Write a program `Time.java`, which reads a number of seconds (an integer) and then prints the same amount of time given in hours, minutes and seconds. An example of an execution:

```
Give a number of seconds: 9999
This corresponds to: 2 hours, 46 minutes and 39 seconds.
```

   Hint: Use integer division and the modulus (remainder) operator.

10. **Sum of Three**
    Write a program `SumOfThree.java` which asks the user to provide a three digit number. The program should then compute the sum of the three digits. For example:

```
Provide a three digit number: 483
Sum of digits: 15
```

If Time Permits

Exercise 11 is marked as *VG task* ==> only mandatory for those of you that aspire for a higher mark (A or B).

11. **Change** (VG-task)
Write a program `Change.java` that computes the change a customer should receive when he has paid a certain sum. The program should exactly describe the minimum number of Swedish bills and coins that should be returned rounded off to nearest krona (kr). Example:

```
Price: 372.38
Payment: 1000

Change: 628 kronor
1000kr bills: 0
 500kr bills: 1
 100kr bills: 1
  50kr bills: 0
  20kr bills: 1
  10kr coins: 0
   5kr coins: 1
   1kr coins: 3
```

Lecture 3 - Using Library Classes

12. **Fahrenheit to Celsius**
Write a program `Convert.java`, which reads a temperature in Fahrenheit and then converts it to Celsius using the formula:

```
C = (F-32)*5/9
```

The result should be presented with a single decimal correctly rounded off.

13. **Short Name**
Write a program ShortName.java, reading a first name and a last name (given name and family name) as two Strings. The output should consist of the first letter of the first name followed by a dot and a space, followed by the first four letters of the last name. An example of an execution:

```
First name: Anakin
Last name: Skywalker
Short name: A. Skyw
```

Hint: Use methods of the String class.
What will happen if the last name consists of less than four letters?

14. **Random Number**
Write a program `TelephoneNumber.java`, generating and printing a random telephone number of the form `0XXX-ZYYYYY`. The area code consists of a zero followed by three digits (X). The local number can not start with a zero (Z), all other digits (Y) are random.
Hint: Use the class `java.util.Random`.

15. **Square Root**
Write a program `Distance.java` which reads two coordinates in the form (x,y) and then computes the distance between the points, using the formula

```
distance = Sqrt( (x1-x2)^2 + (y1-y2)^2 )
```

Sqrt() means "the square root of" and ^ means "raised to". The answer should be presented with three decimal digits.
Hint: Use the class `java.lang.Math` for the computations.

If Time Permits

Exercise 16 is marked as *VG task* ==> only mandatory for those of you that aspire for a higher mark (A or B).

16. **Wind Chill** (VG-task)
Write a program `WindChill.java` that asks the user for a temperature (°C) and the wind speed (measured in m/s) and then computes the so-called *wind chill temperature* using Siple's formula.
For example:

```
Temperature:  -7.8
Wind speed:  8.4

Wind Chill Temperature: -24.5
```

Submission

Only exercises 5-16 should be handed in. (Notice that the VG exercises 11 and 16 are not mandatory.) We are only interested in your .java files. Hence, zip the directory named `YourLnuUserName_assign1` (inside directory named `src`) and submit it using the Moodle submission system.