

# Assignment 1: Getting Started

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## 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](http://www.oracle.com/technetwork/java/javase/downloads). We recommend you to use the latest stable version (Java SE 11.0.1). 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: [www.eclipse.org/downloads/packages](http://www.eclipse.org/downloads/packages). 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. Fahrenheit

Write a program `Fahrenheit.java` using the class `Scanner` to read a real number (The Fahrenheit temperature F) and then print the corresponding Celsius temperature C. The relationship between C and F is:

$$F = (9/5) * C + 32$$

An example of an execution:

```
Provide a temperature in Fahrenheit: 100
Corresponding temperature in Celsius is 37.77778
```

#### 8. 5-year Interest

Write a program `Interest.java` which computes the value of your savings  $S$  after five years given a certain interest rate  $P$  (percentage). You can assume that both  $S$  and  $P$  are integers. The value should be an integer correctly rounded off. An example of an execution:

```
Initial savings: 1000
Interest rate (in percentages): 9

The value of your savings after 5 years is: 1539
```

#### 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
200kr bills: 0
100kr bills: 1
50kr bills: 0
20kr bills: 1
10kr coins: 0
5kr coins: 1
2kr coins: 1
1kr coins: 1
```

### Lecture 3 - Using Library Classes

#### 12. Area

Write a program `Area.java` which reads a radius ( $R$ , a float) and computes the area  $A$  of a circle with radius  $R$ . An example of an execution:

```
Provide radius: 2.5

Corresponding area is 19.6
```

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 RandomSum.java generating and printing the sum of five random numbers in the interval [1,100]. An example of an execution:

```
Five random numbers: 78 13 91 2 36  
There sum is 222
```

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* Twc using the [Wind Chill Index formula](#):

```
Twc = 13.12 + 0.6215*T - 11.37*V^{0.16} + 0.3965*T*V^{0.16}
```

where T is the temperature (Celsius) and V is the wind speed (kilometers per hour). Notice you must convert the wind speed from meter per second to kilometers per hour before you can apply the formula. And we expect you to present the result with one decimal (correctly rounded off). For example:

```
Temperature (C): -7.8  
Wind speed (m/s): 8.4  
  
Wind Chill Temperature (C): -16.7
```

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## 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.