Technische Hochschule Rosenheim

Exercise sheet 2 – Data types and variables

Task 1 – Find suitable data types and identifiers

You should define different variables in a programme. Find the appropriate data type (that uses as little memory as possible) for a variable, which specifies

(1) how many people live in Germany,
(2) how many people live on Earth,
(3) whether it's currently daytime,
(4) the ratio of goals per game of a striker in a football match,
(5) how many semesters you will study,
(6) how many students have registered for a degree programme,
(7) which letter your surname begins with.

Define (i.e. declare) the variables and use meaningful identifiers.

Task 2 - Create a new project, enter a programme to test the use of variables, and start and test it

Create a new project that is called for example `Exercise02`.

Add a new class called `Variables` to the project. To do so, create a new source code file called `Variables`, in which you create the class of the same name with your `main` method:

```
public class Variables {
    public static void main(String[] args) {
```

…

The following variables should be defined in the `main` method of this class:

- `bVar1` as `byte`
- `sVar1` as `short`
- `iVar1` as `integer`
- `lVar1` as `long`
- `fVar1` as `float`
- `dVar1` as `double`
- `isBool1` as `boolean`
- `cVar1` as `char`

After the definition, the following values should be assigned to the variables:

Variable name	Value
`bVar1`	`5`
`sVar1`	`400`
`iVar1`	`-356576`
`lVar1`	`100000000000L`
`fVar1`	`0.123f`
`dVar1`	`0123`
`isBool1`	`false`
`cVar1`	`x`

After the values have been assigned, the programme should output the variables to the console with the instruction `System.out.println`.

If the programme has been successfully compiled and executed, and the above values have been output, add further variables to the programme. Define the following variables and initialise them with the values in the table. During programme execution, these should also be output to the console.

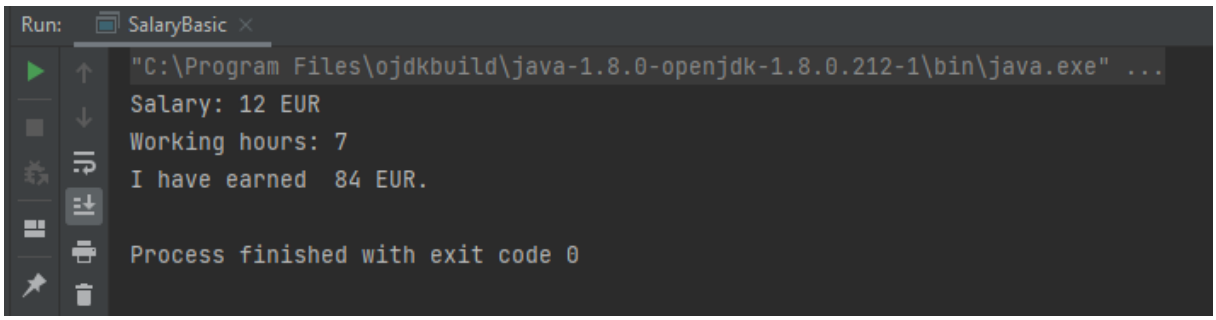
Variable name	Value
`bVar2`	`128`
`sVar2`	`-18453`
`iVar2`	`2147483648`
`lVar2`	`345236577970`
`fVar2`	`4.37456678`
`dVar2`	`3645.987654321`
`isBool2`	`true`

What important insights have you gained for dealing with variables and data types from the programme created?

Task 3 – Earnings calculator

Write a Java programme called `SalaryBasic` that calculates how much money you have earned with your part-time job. For example, the hourly salary for this job is EUR 12 and yesterday you worked a total of 7 hours. Define suitable variables in the programme, as both the hourly salary and hours worked can vary.

The programme should generate the following output:



Task 4 (optional) – Extended earnings calculator

Extend the `SalaryAdvanced` to take into account both overtime pay and extra pay for public holidays. Your employer pays you 1.25 times the normal wage for overtime (i.e. working time beyond 8 hours) and a higher hourly wage of EUR 17.50 on public holidays. Use the appropriate data type for the extra overtime pay, as well as the indicator whether the hours worked were on public holidays or weekdays.