

- Mark your completed exercises in the OLAT course of the PS.
- You can use a template `.hs` file that is provided on the proseminar page.
- Upload your modified `.hs` file for Exercise 2 in OLAT.
- Your `.hs` file should be compilable with `ghci`.

**Exercise 1** *Haskell setup***5 p.**

Set up a working Haskell environment on your computer and get familiar with `ghci`. To do this follow these steps:

- Install Haskell, e.g., via `ghcup`.<sup>1</sup>
  - Run `ghci` in a terminal and evaluate the expression `(5 + 2) * 3`.
  - Find and install a suitable text editor for your system to write and edit `.hs` files.<sup>2</sup> You can try one of the following free editors:
    - Notepad++<sup>3</sup> (Windows)
    - Gedit<sup>4</sup> (Windows, macOS, Linux)
    - Visual Studio Code<sup>5</sup> (Windows, macOS, Linux)
  - Copy or enter the following code in your text editor and save it to a file called `myProgram.hs`. Be sure to use standard double quotes (`"`), but neither two single-quotes (`'`) nor fancy-looking double-quotes (`“` or `”`).
- ```
hello :: String -> String
hello xs = "Hello " ++ xs
```
- Load the file in `ghci` with the command `ghci myProgram.hs`
  - Evaluate the expression `hello "World"`
  - Make yourself familiar with `ghci`. In particular, try the following commands:
    - `:?` – help
    - `:load name.hs` or `:l name.hs` – load Haskell script `name.hs`
    - `:reload` or `:r` – reload current Haskell script
    - `:edit` or `:e` – edit current Haskell script
    - `:set editor someEditor` – set `someEditor` as preferred editor

Further investigate what happens if you type `h` and then the tabulator key, or `hel` and the tabulator key.

You can find links to introductory material about installing Haskell, the command line, etc. on the lecture homepage.<sup>6</sup>

<sup>1</sup><https://www.haskell.org/ghcup/>

<sup>2</sup>Word processors like Microsoft Word, Apple pages,... are not text editors.

<sup>3</sup><https://notepad-plus-plus.org/>

<sup>4</sup><https://wiki.gnome.org/Apps/Gedit>

<sup>5</sup><https://code.visualstudio.com>

<sup>6</sup>[http://cl-informatik.uibk.ac.at/teaching/ws22/fp/ghc\\_setup.php](http://cl-informatik.uibk.ac.at/teaching/ws22/fp/ghc_setup.php)

**Exercise 2** *Writing simple functions***5 p.**

1. Define a function `area r = ...` to compute the area of a circle with radius `r`. (1 point)
2. The average of  $n$  numbers  $x_1, \dots, x_n$  is defined as  $\frac{x_1 + \dots + x_n}{n}$ . Define a function `average x y = ...` that computes the average of two numbers `x` and `y`. (1 point)
3. Is `average (average x y) z` the average of the three numbers `x`, `y` and `z`, i.e., for all possible inputs `x`, `y`, and `z`? (1 point)
4. Is `average (average x y) (average z u)` the average of four numbers `x`, `y`, `z` and `u`? (1 point)
5. Define a function `averageArea r1 r2 = ...` that computes the average area of two circles having radius `r1` and `r2`, respectively. (1 point)