Course
CS-E4110
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General course information and instructions

You should register to the course in Sisu. The use of A+ (or doing the exercises) does not act as a substitute for the registration.

If you have not yet registered, please do that immediately as it is mandatory! However, check the prerequisites before registering.

This 2021 course contains 5 exercise rounds that include programming exercises and multiple-choice questions on the A+ learning platform. In addition, there is a Reactor mini project, which consists of three phases, that should be done in numerical order.

In addition to the exercise rounds here, there is other support and material available: discussion channel, discussion sessions, a textbook and summary slides. The course's MyCourses page contains the relevant links, weekly schedule, and the summary slides.

Programming exercises

The programming exercises are written in `Scala` and built using `sbt`. `sbt` manages the project dependencies and can be used to compile and run Scala projects. In this case, `sbt` is used to download the necessary dependencies such as Akka and testing libraries.

Required tools

The recommended `sbt` version is 1.x, specifically 1.5.5. If you have not installed `sbt`, you can follow the installation instructions at https://www.scala-sbt.org/1.x/docs/Setup.html

If you don't have installer rights, you can download the zip release from https://github.com/sbt/sbt/releases/tag/v1.5.5, unzip it, and add the bin folder to PATH environment variable, or run `sbt` directly from the bin folder.

In addition, you need Java Development Kit (JDK) to compile and run the programs in the Java Virtual Machine. `sbt` works with JDK versions 8 and 11.

Exercise templates

The programming exercise templates are given as a ZIP file, which is found in each programming exercise description. The template root folder contains a `build.sbt` file as well as `src/` folder. In the `src/` folder, there are `main/scala/` and `test/scala/` folders.

The `main/scala/` folder contains the scala file which you edit to implement the requested behaviour. This file is the one that you submit to A+.

The `test/scala/` folder contains tests you can run to verify that your program runs correctly before submission. Note that the tests do not test every possible scenario, and in the end it is up to you to make sure that the program works as intended. You can implement additional tests there, if you want to increase the coverage of the tests, and creating new tests is the easiest way to run your code. Reading the tests can also help you understand what the expected behaviour of the program is.

Sbt usage in exercises

1. Download and unzip the assignment template. The exercise code template ZIP package is found in each programming exercise's description.
2. Navigate using a command line to the template root folder. It contains the `src/` folder and `build.sbt` file.
3. To run the tests that come in the template, use the command `sbt test` in the project's root directory. If you run the command before implementing the requested methods, you will notice the tests failing with `NotImplementedError`. Now, implement the methods required by the exercise and run the tests until all test cases pass.

Sometimes, the testing environment doesn't run as you'd expect even when you have checked that everything is as it should be. Running the command `sbt clean` may help in some cases.

Submission

For the automatically graded rounds, note that only 10 submissions are allowed per each programming exercise round, use them wisely!

When you think your implementations are finished you can submit your solutions for grading. For exercise rounds 1-5, the testing is **automated** and you get immediate feedback. The grading is **manual** for the three phases of the Reactor mini project, so prepare yourself for delays. The grading rules are also somewhat different (late penalties, etc.)

The submission form is at the end of each exercise description. In each programming exercise, you only need to submit a single file which contains your method implementations. Ensure that the name of the file you are submitting is the same as the required file. The name of the required file is always given on top of the submission form. Grading may be run almost immediately, or it may take several minutes, depending on the server load.

Multiple choice questions exercises

In addition to programming exercises, some exercise rounds contain multiple choice questions. Their grading is done automatically by the server.

Note that only 5 submissions are allowed per each multiple choice exercise, use them wisely!

Doing the exercises

The course requires both programming skills and understanding the theory related to those skills. Being able to write concurrent program code is important.

Setting up the programming environment is a high priority, as the first round already contains programming exercises. To that end, the next page contains a Hello World -assignment, which you use to setup your environment, try out the tools, and learn to submit a code file.

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