
Exercise 5: Concurrency



Concepts and Technologies for Distributed Systems and Big Data Processing – SS 2016

Task 1 Happens-before

Answer the following questions:

- What is a *happens-before* relationship?
- Which constructs of the Java language and the Java standard library presented in the lecture establish a *happens-before* relation?

Task 2 Concurrent locking of multiple objects

Have a look at the code on the course website provided as ZIP file containing a Maven project, which can be imported into your IDE. An Eclipse project is provided, too. If importing the Eclipse project should not work, please have a look into the informatory section at the end of the exercise to see how to import a Maven project into Eclipse.

Implement the code for the lock method in the `MainLock` class, which should lock the given list of `Data` objects. `Data` objects contain a unique numerical id and a lock instance, which can be used to lock the objects. Multiple threads may try to lock the same objects concurrently. Make sure that concurrent locking attempts do not deadlock.

In order to implement an alternative approach, complete the code for the lock method in the `MainSynchronized` class, which should lock the given list of `Data` objects. Instead of the data object's lock instance, use the synchronized Java language construct on data objects.

Importing the Maven project into Eclipse

In Eclipse, open the *Import* dialog via *File* → *Import*.

Choose *Existing Maven Projects*.

Choose the root directory of the Maven project containing the `pom.xml` file.

Select the project and click *Finish*.