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Advanced Aspects of Object-Oriented Programming (SS 2015)

Practice Sheet 13

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(before the lecture as PDF via E-Mail)

Exercise 1 Calculator

a) Take the calculator example of the lecture and implement it with Swing according to the MVC-Pattern. Implement also division and multiplication.

b) Extend the calculator, such that it only allows the input of numerical data and handles errors. Which kinds of errors are handled in which parts of the MVC-Pattern?

Exercise 2 MVC

In the following we will look at a program to organize a ladder.

a) Download the source from the lectures website and sketch the architecture of the program. Which parts can be considered to be a model, a view or a controller and how do they interact and reference each other?

b) The program does not follow the Model-View-Controller pattern, where does it differ? Change the program to comply with the MVC pattern.

c) Add a second frame to the program, it should display a textual representation of the current ladder. Open both windows simultaneously and keep them in sync, i.e. changing the ladder in one window, also changes the presentation in the other window. Does the usage of the MVC Pattern simplify this task?

"Problems worthy of attack; prove their worth by fighting back."
Piet Hein (1905–1996)

Exercise 3 The OSGi Framework

In the following, we use the Equinox implementation of an OSGi Framework. The easiest way to work with Equinox, is using eclipse with the plug-in development tools. You find a tutorial on developing, building, and deploying OSGi bundles with eclipse at `http://www.vogella.de/articles/OSGi/article.html`. It is recommended to deploy and use your bundles in a standalone server, because inside eclipse a lot of exceptions might get thrown. Use the latest Kepler release (KeplerSR2). The jar file can be downloaded from the Eclipse Equinox site. The command to start the current version of equinox (kepler-stable 3.9.1) is:

```
java -Dosgi.console.enable.builtin=true -jar org.eclipse.osgi_3.9.1.v20140110-1610.jar -console
```

a) Develop a dictionary service, that checks a word for its correct spelling. The Service should offer the following interface:

```
package dictionaryservice;
public interface Dictionary {
    boolean checkWord(String word);
}
```

It is enough, if your service can check the quote from above.

b) Develop a client with a GUI, that allows a user to use the dictionary service. If the dictionary service is not available anymore (i.e. the bundle has been stopped), the client should show an error message. When the dictionary returns, the client should be functional again.