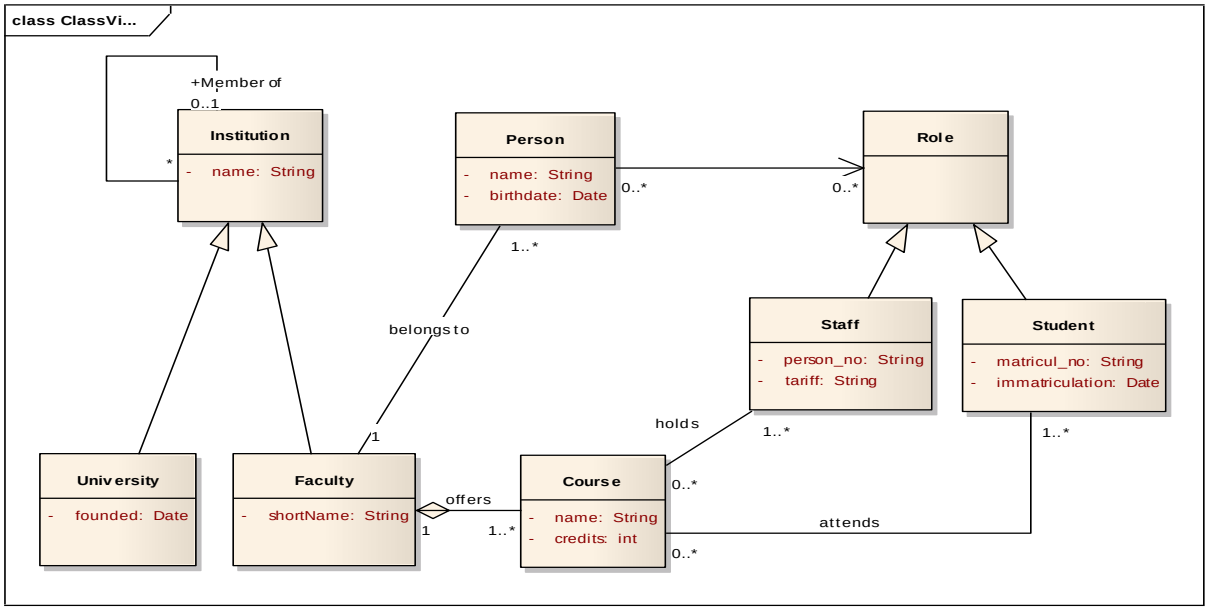
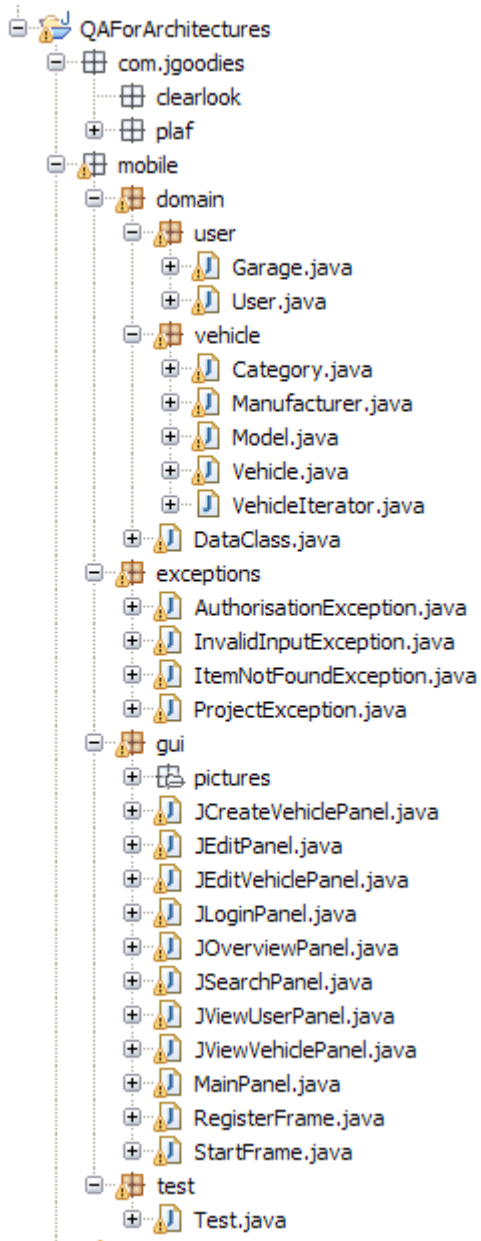
1. Given is the following (simplified) diagram of a university system.



As you can see, all classes are in one package “Monolith”. Divide the system into two reasonable packages and eliminate resulting cycles.

2. In this exercise we use an application that was built in a software project in one of our bachelor courses to check if the system violates the defined architecture.

   The application is a fat-client-application that allows offering cars and motorcycles (like i.e. mobile.de). The business-classes store their data in flat files, so there is no data-access layer. The application has some swing-guis. They use an external library for displaying nicer guis. This is the structure of the application



   As you can see, there is an additional package “exceptions” that includes all the exceptions that are thrown by the application. The package “domain”, the business classes, is divided into two sections “user” and “vehicle”.

a) Try to compile and start the application (main-class is mobile.gui.StartFrame; Userid: admin, Password: admin). Play a little bit around. Have a short look at the sourcecode.

b) Divide the architecture of that application horizontally (draw a sketch). Define the dependencies. Discuss your results.

   Hint: The subsystems of the layers match the first level in the tree given above.

c) Divide the architecture of that application vertically (draw a sketch). Define the dependencies. Discuss your results.

   Hint: you easily can find the vertical slices if you examine the domain-package in the tree given above.

d) Now use Sonargraph Architect for Java (find the download link and the activation code in the E-Learning system) and try to find out all problems that the supplied application has compared to your architecture description.

   To do this, follow these steps:

   - Create a new System in Sonargraph.
   - Import the files as Eclipse-Workspace from part a) of the exercise.
   - Create two new architecture-files, one for the layering and one for the vertical slices. Fill them according to the example in the script.
   - Add those two files to the “Architecture Check” (right-click on them in Files-Tab).
   - In the Issues-Tab check the entries under the category “Architecture Violation”