

Software Architectures

Assignment 5: Software Visualizations

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Deadline: 22 May 2014, 23:59

In the final assignment you will get acquainted with software visualizations. You will use the *Moose* tool suite and the *Mondrian* scripting language to visualize the web portal application from previous assignments.

NOTE: This assignment uses all kind of technologies you have most likely not used before. You are advised to start early.

Assignment

For this assignment, you should write a report that includes the visualizations you have created, the code you used to generate them, and an interpretation of what can be seen on them.

Deadline 22nd May 2014 at 23:59. The deadline is fixed and cannot be extended.

Deliverables Write a report, in English. The report should be handed in as a single PDF file on the Software Architectures course page in PointCarré. Click on *Assignments (Opdrachten) > Assignment 5*.

The file should follow the naming schema (Firstname-Lastname_)*5.pdf, for example: Kennedy-Kambona-Janwillem-Swalens_5.pdf.

Team work You are allowed to work alone, or in a team of two. Only one of you should submit the report on PointCarré, but be sure to mention both names in the report.

Grading The exercises will be graded and can become subject of an additional defense.

Context

In this assignment you will visually analyze the web portal application (use the original version) from the previous assignments. Using the *Moose* tools, you will assess the architecture of the web portal. This assessment consists of an evaluation of the benefits

of the current architecture (in terms of reuse, good design, modularity, low coupling. . .) as well as the identification of points for improvement (e.g., violation of layered design, tightly coupled components, and so on). To this end, you can use all the tools that are made available in Moose, and you will be asked to make your own custom visualization.

Exercise 1: Analyzing the web portal application with an existing visualization

In the lecture on software visualizations, you have been presented with various examples of visualizations such as the *System complexity view*, *Distribution maps*, *Class blueprints*, and so on. All of these visualizations are implemented by Moose and can therefore be readily applied to the web portal application. In this first exercise, you should pick one of the visualizations made available by Moose (not necessarily one that was described in class), and apply it to the web portal system. Note that most of these visualizations can be configured. For example, the *System complexity view* can be customized to use different software metrics to determine the dimensions of the entities in the visualization.

What is expected of you:

- Pick one of the predefined visualizations of Moose and apply it to the web portal application. Configure this visualization for your needs.
- Make a screenshot of the visualization and annotate (using a graphical editor) the points of interest in the visualization.
- Write a short report (**one A4 page**, not including the screenshot) that describes what can be seen in the visualization and how this is linked to the quality of the architecture of the web portal application.

Exercise 2: Building your own visualization with Mondrian

Visualizations provide a suitable means to confirm your hypotheses regarding the quality of a software system. They can reveal where there are some good software practices or some places for improvement present in the system. For example, while the web portal system is designed to be a layered, three-tier architecture, this architecture is (intentionally) violated in the source code.

In this second exercise, you will use the Mondrian scripting language to create your own (simple) visualization that illustrates one such advantage or problem in the web portal system.

What is expected of you:

- Use Mondrian to make a small, simple visualization of the web portal application.
- Make an annotated screenshot (similar to exercise 1) of your visualization applied to the web portal application, indicating what can be seen in the visualization.

- Write a short report (up to **two A4 pages**, not including the screenshot) that briefly describes the idea you want to show in the visualization, that motivates your visualization (why did you construct it like this?) and that discusses some of the findings.
- Add the source code of your visualization as an appendix to your report.

Using Moose

On PointCarré, you can find a **.zip** file that contains the Moose tool suite (a single file for Windows, Mac or Linux). The Moose tool suite in the zip file comes with the model of the web portal application pre-loaded.

When opening the Moose tool suite, you have the **Moose Panel** opened and loaded with the Web portal application, which appears as the model (**web_portal**).

Here some useful points:

- To open the Moose Panel, right click on the background of the suite to open the World menu – Moose – Moose Panel.
- To open the Mondrial editor from the model (Web portal), you need to select the model, right click – Browse – In Mondrial Easel.
- To run scripts in the Mondrian editor (written in the Script panel), click on the black checkmark on top of it. This displays the visualization on the Painting panel.
- To explore the visualizations in the Moose suite (e.g. for Exercise 1), select any list or element displayed in the column of the Moose panel, right click – Visualize. Remember that they differ depending on the list/element you are selecting.
- To explore the script examples of Mondrian, go to the World menu (as in the first option), right click Moose – Mondrial Easel. This contains the option Examples in the menu, which includes an exhaustive list of features that you can include in your visualizations.

You can find documentation for the Moose tool suite and Mondrian scripting language at:

- The Moose manual: <http://www.themoosebook.org/book>
- Chapter on the visualizations: <http://www.themoosebook.org/book/externals/visualizations>
- Chapter on Mondrian: <http://www.themoosebook.org/book/internals/mondrian>
- An overview of the model used internally by Moose to represent the code: <http://www.themoosebook.org/book/internals/famix/core/overview>