Qualidade de Software – part 1

Mestrado Integrado em Engª Informática – Ano Lectivo de 2019/2020, 1º semestre

Specification for the first assignment – version 1.0, 2019-09-19

This assignment of part 1 of QS1819 is the first of two, in which two systems of non-trivial dimensions and complexity are analyzed: a system specific of each group selected by the students; and `JHotDraw5.2`. In the analysis and reporting, priority should be given to the group's specific subject system. `JHotDraw5.2` serves mainly as a "benchmark" or reference point – an example of a fairly well balanced system.

Assignment 1 aims at collecting and reporting an initial diagnosis of the two target systems – a "view of the forest" before going into more detail to the whatever problematic "trees" were detected. The main tools to be used are: (1) `SourceMiner`, (2) `Metrics` – an `Eclipse` plugin (http://metrics.sourceforge.net/) and (3) `inFusion` (already available at *Moodle*), a standalone tool that builds the *Overview Pyramid* and also reports on some bad design symptoms (e.g., *God Class, Brain Method*) covered by the lectures and the Lanza et al book – in fact, `inFusion` and `iPlasma` are creations of that book's authors.

Students will of course conduct their analyses the way they see fit, but a few simple guidelines are next provided. Ideally, the first impressions and initial exploration should be carried out using `SourceMiner` (visualization is ideal for these purposes). `Metrics` will serve as a complementary source of information. Note that `SourceMiner` is also useful for subsequent phases of the system's exploration, including a particularly important part: how two different metrics relate, in ways that bring insights and call into attention possible special/extreme/stranger cases. In such cases, as well as cases (e.g, methods, classes, packages) whose metric values stand out, a quick look at the actual code is warranted, e.g., to determine whether the code seems stable or potentially troublesome. Note also that these first analyses can already be carried out in view of future reengineering interventions that students will recommend in their second assignment. Students can take advantage of this first assignment to take notes and gather useful information for the second assignment.

To illustrate the analysis expected, consider a system in which a class is coupled to an abnormally high number of other classes. Such a class deserves a more careful look, since a high magnitude for coupling may indicate that the class corresponds to one of the following cases, or several simultaneously: (1) it has a particularly important role in the system; (2) distribution of responsibilities across the various classes is inappropriate and makes future intervention (e.g., refactoring) advisable; (3) the class is an obstacle to the system's evolution and is also a factor of degradation of its structure and long-term maintainability.

Try to be as systematic as possible while carrying out the analyses. Also, in case you have something interesting to say about, e.g., how the project was mounted on `Eclipse`, obstacles overcame, any prior "curating" that was required, state then in a section specifically for that purpose (written in a way that e.g., can be easily and quickly replicated on another system).

The format for the two reports is ACM. A `doc` template is available at the course's *Moodle* area. Note that `LaTeX` templates can also be found at the Net. The report should never exceed 8 pages and you probably use less. The report should be written in either Portuguese or English, following the good practices of organization of technical reports (summary, conclusions, etc).

The report should provide a short presentation of the specific subject system, e.g., application domain, whether it is a full-fledged application or a framework (as `JHotDraw5.2` is), mode of use (e.g., web, standalone). Note you do not need to actually run the subject system. There is no need to provide presentations of the actual metrics: just cite the suitable sources. In citations, always include (at least) the standard items of information: author's first name, title, publisher, year of publication.