Supervisor's statement of a final thesis

Student:	Bc. Otakar Vinklář
Supervisor:	Ing. Filip Křikava, Ph.D.
Thesis title:	Analyze Scala Code Using Graph Database
Branch of the study:	Computer Science

Date: 15. 6. 2020

Evaluation criterion:	The evaluation scale: 1 to 4.
1. Fulfilment of the assignment	***1 = assignment fulfilled,*** *2 = assignment fulfilled with minor objections,* *3 = assignment fulfilled with major objections,* *4 = assignment not fulfilled*

Criteria description:
Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently.
In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

Comments:
This thesis provides an alternative solution for doing exploratory analyses of large Scala code bases.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
2. Main written part	*95 (A)*

Criteria description:
Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies? Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 26/2017, Art. 3. Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

Comments:
The thesis is well written and well structured. It clearly describes the solution and the design decisions taken.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
3. Non-written part, attachments	*95 (A)*

Criteria description:
Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

Comments:
The resulting tool allow one to import semantic information about Scala code into a graph database. It was implemented within an existing research project. All the considered projects (about 18M lines of code) were imported and are now queriable using the Cypher language.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
4. Evaluation of results, publication outputs and awards	*95 (A)*

Criteria description:
Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.

Comments:
The tool works and could be used to query large corpus of Scala code. There is a clear path for making it more generic so that it can be used for other analyses than the one used in the OOPSLA paper. Such tool would then become beneficial for the community especially in the light of migration from Scala 2 to Scala 3. Such a contribution would be welcome as a tool paper to Scala Symposium 2021 (co-located with ECOOP), I hope that the student will continue working on it.

Evaluation criterion:	The evaluation scale: 1 to 5.

5. Activity and self-reliance of the student	5a: **_1 = excellent activity,_** _2 = very good activity,_ _3 = average activity,_ _4 = weaker, but still sufficient activity,_ _5 = insufficient activity_ 5b: **_1 = excellent self-reliance,_** _2 = very good self-reliance,_ _3 = average self-reliance,_ _4 = weaker, but still sufficient self-reliance,_ _5 = insufficient self-reliance._

Criteria description:
From your experience with the course of the work on the thesis and its outcome, review the student's activity while working on the thesis, his/her punctuality when meeting the deadlines and whether he/she consulted you as he/she went along and also, whether he/she was well prepared for these consultations (5a). Assess the student's ability to develop independent creative work (5b).

Comments:

Ota managed to dive into the problem and self-organize very well. He made a steady progress during the semester. He was always well prepared on our meetings.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
6. The overall evaluation	*95 (A)*

Criteria description:
Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.

Comments:

I wish we had this while we were working on the OOPSLA paper! The graph representation makes much more sense and the queries are simpler to write and reason about.

In the scope of this thesis Ota had to learn quite a few technologies (Scala, semanticdb as a format of storing semantic information extracted from Scala code, Google protocol buffers, Neo4J with the Cypher query language) as well as to understand the original analysis pipeline, the structure of Scala projects and the actual analysis we have done for the Scala implicits. He managed not to get overwhelmed and delivered a working tool.

Signature of the supervisor: