FACULTY OF INFORMATION TECHNOLOGY CTU IN PRAGUE

Supervisor's statement of a final thesis

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Supervisor: Ing. Petr Máj

Thesis title: GNU-R Debugger Bytecode Support

Branch of the study: System Programming

Date: 7. 1. 2019

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:
Student fulfilled the objectives of the thesis adequately.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
2. Main written part	*51 (E)*

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:
Sadly, the thesis is very poorly written. Its organization suggests that the student followed diligently the usual steps of researching the current status, looking for alternative implementations in similar projects, devising and implementing the improvement and its evaluation, but the actual thesis is riddled with issues which greatly diminish its usefulness:

On large scale, several sections of the thesis are either too long, or too short and instead of explaining the work done leave reader with more questions. On small scale, the sentences in the text often make very little sense and peculiar, if not outright wrong language constructs are used. Combined with grammatical errors, typos and typesetting issues (missing figures, overflowing text, etc.) it paints a picture of hastily crafted work.

The evaluation section is especially bad - providing virtually no information about the methodology of the tests, rendering them useless (see comments in 3).

However, I do acknowledge that the student is submitting the thesis in English language and so the work required to put his thoughts in writing was greater than usual.

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:

Contrary to the written part, the actual code of the project is much better. The student has chosen a hard topic to begin with - extending features of very large, largely undocumented, heavily patched and used program, such as the R virtual machine. In this, the student succeeded and added two crucial parts to the R bytecode ecosystem - the disassembler and bytecode debugger.

In order to do so, not only was new code needed, but the R vm itself had to be patched, which is no easy task.

My wish is that the student elaborated much more on both the description of the tests, as well as their scope, but given the fact that testing a disassembler and even more so the debugger is very hard task in its own right.

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

Modulo the written parts, the thesis solves an important issue in the R ecosystem in a clean and easy to maintain package. The disassembler can (and should) be uploaded as CRAN package to R so that it can be used by other developers immediately. The situation with the debugger is a bit more complicated as it requires patches to R itself, which can take long time, but I believe it would be valuable addition.

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:

I am not entirely sure how to evaluate in this section. I believe the student is very active in his work and is extremely independent. On the other hand, this independence is sometimes a bit too much. While he obviously is a good programmer, it is my belief that if more frequent interactions with the student were possible (i.e. if he regularly updated on his progress, etc.), at least the written part could have been greatly improved.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
6. The overall evaluation	*81 (B)*

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:

Although the written part of the thesis was very far from being perfect, I believe this was mostly due to missing regular interactions with the student. Given the very good quality of the actual code and the overall difficulty and maturity of the actual solution makes me not pay much attention to it.

The code on the contrary was well written and the proposed problem was properly solved. and I believe the student deserves the B mark.

Signature of the supervisor: