



Review report of a final thesis

Reviewer: Dr. Francesco Dolce
Student: Ivan Romanenko
Thesis title: Algorithms related to generalized palindromes in SageMath
Branch / specialization: Web and Software Engineering, specialization Software Engineering
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Evaluation criteria

1. Fulfillment of the assignment

- [1] assignment fulfilled
- [2] assignment fulfilled with minor objections
- ▶ [3] **assignment fulfilled with major objections**
- [4] assignment not fulfilled

The assignment was partly fulfilled. The main objections are the written presentation (see below) and the absence of explicit code for the algorithms presented in Chapter 3 (i.e., assignments 3 and 5).

2. Main written part

60/100 (D)

The manuscript contains too many linguistic errors and should be reviewed by the author, preferably with the help of an English speaker.

In particular the use (mostly "the absence") of articles should be corrected. This is particularly important, for instance, when distinguishing between "a" longest palindromic substring and "the" longest palindromic substring (that may not be defined, since not unique).

Also, when referring to a particular result or a part of the paper the capital letter should be used (i.e., "the previous lemma" but "using Lemma 3.3.")

I suggest to remove the Notations part at the beginning of the manuscript, since all notations are actually defined later (or, in alternative, if the idea is to allow the reader to skip the first two chapters, to complete it with all the important notation used).

In the Introduction, instead of focusing on what the reader can skip, the author should specify which parts are interesting to a specific purpose.

Several small mistakes can be found already in the Preliminaries Chapter. For instance, in the proof of Lemma 2.6 the order of the morphisms $\varphi \circ \psi \circ \varphi^{-1}$ should be inverted, while in the following one $\psi(u)=u$ should be replaced with $\psi(v)=v$.

Finally, the manuscript could be extremely improved by adding examples and (this is the most important remark, see also later) a code or pseudo-code of the algorithms described in Chapter 3.

3. Non-written part, attachments 55 /100 (E)

The code effectively written (on Chapter 2) seems to work. The algorithm presented later also make sense, but not code nor pseudo-code is available.

4. Evaluation of results, publication outputs and awards 65 /100 (D)

The results presented are certainly at the level of the on-going research. In view of paper [10] I'm not completely sure a publication of this manuscript is conceivable (for sure not in the present form): a comparative study of the algorithms should be done first.

The overall evaluation 60 /100 (D)

The manuscript is an advanced draft, with several linguistic mistakes and a few scientific ones (see above). Also the absence of code for the most important results discussed is a big minus. Nevertheless, the choice of topic is worthy and the results found interesting (although non totally complete).

Questions for the defense

The main question is whether it is possible to write a code for the algorithms described in Chapter 3.

Moreover, what is the relationship between the algorithms described here and the ones by Rubinchik and Shur in [10]?

Finally, would it be possible to build an algorithm going in the opposite direction, that is that given a number n (and maybe some other parameters, like the size of the alphabets) construct a word with palidnromic defeact (resp. G-defect) n ?

Instructions

Fulfillment of the assignment

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.

Main written part

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. 52/2021, 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.

Non-written part, attachments

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.

Evaluation of results, publication outputs and awards

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.

The overall evaluation

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.