REVIEWER´S ASSESSMENT OF FINAL WORK

I. IDENTIFICATION DATA

Title:	String attractors (*Atraktory řetězců*)
Author´s name:	Veronika Hendrychová
Type of assignment:	Bachelor Project
Faculty:	Faculty of Nuclear Sciences and Physical Engineering (FNSPE)
Department:	Department of Mathematics
Reviewer:	Dr. Francesco Dolce
Reviewer´s affiliation:	Faculty of Information Technology, Czech Technical University in Prague

II. ASSESSMENT OF CRITERIA

Work assignment — **demanding**

Assess how demanding the work topic is.

The topic of this thesis is on the very edge of current research in the field, the assignments were ambitious and not trivial.

Fulfilling the assignment — **fulfilled**

Consider whether the work submitted meets the assignment. If necessary, give your comments on items of the assignment not fully answered, or judge whether the scope of the assignment has been broadened. If student failed to fully treat the assignment, try to assess the importance, impact and/or the reasons for the failings.

All the points in the assignment are fulfilled. In particular, point 5., the most ambitious one, leaded to new interesting results on string attractors on Complementary-symmetric Rote sequences. I want to insist that such results are research-level (an ArXiv extended version of them is already online) and definitely above the average of bachelor thesis-level.

Chosen approach to solution — **appropriate**

Assess whether student applied a correct approach or method of solution.

Both the theoretical part and the applied ones, i.e., the one containing the Python algorithms, are, to the best of my understanding, correct (In particular I checked and tested the presented algorithms on multiple set of words).

Professional standard — **excellent**

Assess the professional standard of the work, application of course knowledge, references, and data from practice.

The student shows her understanding of the field. The references are up-to-date with the current state of research.

Level of formality and of the language used — **excellent**

Assess the use of scientific formalism, the typography and language of the work.

The manuscript is very well written in a clear and concise way. My only very minor remark is on the succinctness of the first Chapter with respect to the following ones (this could be completely excused, though, being the manuscript an undergraduate thesis and not a survey paper).

Choice of references, citation correctness excellent

Assess student´s effort in finding and using study sources for completing their work. Give characteristics of the references chosen. Assess whether student made use of all the relevant sources. Verify whether all items used are properly distinguished from the results obtained by student and their deliberations, whether there are no violations of citation ethics, and whether the bibliography presented is complete and complies with the citation usage and standards.

The references used in the manuscript are pertinent and up-to-date with the state of the art in the topic.

Further comments and assessment

Give your opinion on the quality of the main results obtained in the work, e.g. the theoretical results, or the applicability of the engineering or programming solutions obtained, publication outputs, experimental skills, and the like.

This thesis is clearly of high quality, both in its form and its contents. The theoretical part contains new results worth publishing and the coding part provide useful tools for performing experiments and prove/disprove conjectures.

In the case the manuscript could still be edited before a definitive version, I'd like to add some very minor remarks (mostly typos or linguistic suggestions):

- Page 2, line -6 of paragraph 1.2: I suggest to add « of them » after « multiple ».
- Page 4, line before Theorem 1.7: replace « the lower bound » with « a lower bound ».
- Page 6, line 2 of Definition 2.4: replace « is a unique sequence » with « is the unique sequence ».
- Page 6, Theorem 2.6: I suggest either to move Example 2.17 after the proof or to change the environment of « proof » into « proof of »; same remark for Theorem 2.17.
- Page 7, line -4 of the proof: the sentence «and cross the attractor position of {\tt 1} » is true but not trivial; you should explain why when it cross the position relative to 0 in u_{n-1} then you can find another occurrence crossing the position of a couple of lines above (as you did in the other proofs later).
- Page 7, before Definition 2.13: precise that the binary alphabet you'll use is {0,1} (and not, e.g., {a,b}) and that on occasion you'll treat them as number (e.g., when interchanging them by using the property y = 1-x).
- Page 7, Definition 2.13: precise that the bar map can be extended to words by composition (that is \overline{uv} = \overline{u} \overline{v}).
- Page 8, line -2 of Example 2.19: why « i \geq 3 » and not « i \geq 2 »?
- Page 10, line 3 after Definition 2.23: replace « u_n » with « u_{n-1} ».
- Page 10, last line: I suggest to add « later » (or something similar) when talking about Observation 2.30.
- Page 11, Observation 2.30: correct the overflow.
- Page 12, line 2 of Theorem 2.32: instead of « number of letters » I'd recommend « numbers of distinct letters ».
- Page 15, second part of Example 2.33: formulae for w_1 to w_5 are redundant and could be skipped (you write the are identical to the previous case)
- Page 17, line 26 of the code of Algorithm 2: the « abs » function is not necessary here. Also, the algorithm could be easily modified to accept every binary alphabet (and even to larger arbitrary alphabets, if you decide to generalise the notion of pseudopalindromic).

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REVIEWER´S ASSESSMENT OF FINAL WORK

III. OVERALL ASSESSMENT, QUESTIONS TO BE ASKED DURING THE WORK DEFENCE, SUGGESTED GRADE

Summarize those aspects of the work that were significantly influential for your overall assessment. Suggest questions to be answered by student during the defence of the work before the examination board.

I judge this work in very positive terms. The candidate shows her mastering of the topic and her ability in finding new interesting results.

My main questions arise from the Conclusion chapter: does the candidate have any intuition on how to generalise these results to prefixes of word obtained by arbitrary combinations of palindromic and anti palindromic closures? Or on larger alphabets? Or on factors instead of prefixes?

Suggested grade: **A - excellent**

Date: 18.08.2023

Signature: