Models of Computation

1: Introduction

Organization

Lecture: Tuesday 14:15 - 15:45, room -1.64 north building
Practice class: Tuesday 16:00 - 17:30, room -1.64 north building

Web page: http://people.inf.elte.hu/lukovszki/Courses/2223MC

For successful completion:
1. Active partitipation and work in solving and discussing excercises in pactice classes
2. passing >=50% of the 10 min. tests at the beginning of the practice classes
   - Test in week k is for the content of week k-1
3. Successful exams (grade is computed as average of 2 exams).

Important dates:
- midterm test/exam (written): 2022-10-18
- final test/exam (written): 2022-11-22
- repeat exam (second trial exam in case of unsuccessful exam): 2022-11-29

Content

- Introduction
- Classical models of computation
- Finite automata, regular expressions, regular pumping lemma
- Push-down automata, context-free pumping lemma
- Turing machines, variants
- Decision problems, undecidability
- P, NP, PSPACE,…
- Reduction
- Hierarchy theorems
- Circuits
- Models of parallel and distributed computing
- Unconventional models of computing (natural computing)

Literature

- J. E. Savage, Models of Computation: Exploring the Power of Computing, Brown University, 1998. https://cs.brown.edu/people/jsavage/book/pdfs/ModelsOfComputation.pdf
- M. Fernandez, Models of Computation: An Introduction to Computability Theory (Undergraduate Topics in Computer Science), Springer, 2009
- M. Sipser, Introduction to the Theory of Computation, 3rd edition, Cengage, 2012