Fundamentals of Theory of Computation II

1: Introduction

Organization

Lecture: Monday 8:15 - 9:45, room 2.502

Practice class:
Monday 10:15 - 11:45, room 1.819
Tuesday 16:00 - 17:30, room 0.312

Web page: http://people.inf.elte.hu/lukovszki/Courses/25FOTOC2

For successful completion:

1. Active partitipation and work in solving and discussing excercises in pactice classes
2. Achieving >=50% on the 10-minute 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): 2025-03-17
- final test/exam (written): 2025-05-05
- repeat exam (second trial exam in case of unsuccessful exam): 2025-05-12

Content

- Introduction
- Turing machines, variants
- Decision problems, undecidability
- Reduction
- P, NP, coNP
- NP-completeness. NP-complete problems
- Space complexity and complexity classes
- Hierarcy theorem
- Approximation algorithms

Literature

- M. Sipser, Introduction to the Theory of Computation, 3rd edition, Cengage, 2012.
- M.R. Garey, D.S. Johnson: Computers and Intractability: A Guide to the Theory of NP-Completeness. W.H. Freeman, 1979.
- J. E. Hopcroft, R. Motwani, J. D. Ullman: Introduction to Automata Theory, Languages, and Computation, 3rd ed. Pearson Education Ltd., 2014.