Exam preparation

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1. Exam subjects

Exam subjects given on the last year's course page (scroll down to "Test samples"):
https://sites.google.com/view/fii-pa/2022/lectures

Other exam subjects: FII Materials (Algorithm Design section)

There is also a test sample posted on the Discord channel on the test-sapt-8 subchannel

2. How to prepare for this exam

- Revisit the courses and the exercises made during the seminars. Make sure you understand the theoretical concepts and that you know how to apply them.

- It may be helpful to also see the course materials from the previous years (https://sites.google.com/view/fii-pa/2022/lectures), as they may contain additional useful information such as solutions to new exercises, YouTube videos, etc.
(For example, the first link from Lectures 5,6 contains besides other things, a solution for exercise 10 from the seminars 5&6:
the reduction from 3-SAT to Independent Set).

- Try to solve other exercises from the seminars (including those for which we only discussed the ideas) and the exercises from the exam subjects from the previous years. When solving an exam sample, it is very useful to simulate the exam conditions (no access to course or seminar materials and a fixed time to solve the exercises) to see how fast and how well you can solve the exercises under real conditions.

3. Tips for the exam

- At the beginning of the exam, briefly read all the exercises and estimate how much time you want/need to spend on each of them. Check from time to time to see if you are not exceeding too much the allocated time.

- Be very careful when reading the exam exercises.

- During the exam, ask any clarification questions you need in order to understand the tasks

- Be careful if you want to translate terms from English to Romanian (for e.g., "nondeterministic" = "nedeterminist" (nu "nondeterminist" sau "nondeterministic"))

- Always make sure you think about the corner cases for a problem

- Make sure you know the difference between deterministic, nondeterministic and probabilistic algorithms
(For example, if you are asked to write a nondeterministic algorithm and you write a probabilistic one, you may not receive any points)

- When defining a problem as an input-output pair, use as many mathematical notations as possible instead of using words
(otherwise, you may lose points). Additionally, you can also add a description of the problem using words.

- Always justify your answers instead of just writing the response with no explanations.

- If you do not have time to write the code for a pre/post-processing step for a reduction, explain the ideas with words.
In some cases, this may be enough. If the pre/post-processing step is (very) difficult, you are generally expected to only describe the step and not give the code for it.

- If an exercises has multiple subpoints, it is common to need to use the solutions from the previous subpoints to solve the current one.
Instead of trying to solve a subpoint directly, try to see first if you can use the answers from the previous subpoints.

4. Other resources useful for the exam

- Sorting algorithms, analyzing the best, avg. and worst case for several sortings, general complexity analysis, KMP (the last one useful for the final exam) -> Truly understanding algorithms (canalul dnului profesor Ciobaca)

- Analyzing complexity: Resource1 Resource2

- Loop Invariants (useful to use when trying to prove that an algorithm is correct - that it actually solves the problem): Resource3

- (unofficial) solutions to some exercises presented in the book "Introduction to Algorithms" (T.H. Cormen, C.E. Leiserson, R.L. Rivest). This is one important book on which the course is based.