Task 8 (Extended). Practical analysis of advanced algorithms

Goal

Practical analysis of advanced algorithms

Book: *Thomas H. Cormen Charles E. Leiserson Ronald L. Rivest Clifford Stein Introduction to Algorithms Third Edition, 2009 (or other editions).*

Sections:

- *I Foundations*
  - *4 Divide-and-Conquer*
  - *5 Probabilistic Analysis and Randomized Algorithms*
- *VI Graph Algorithms*
  - *23 Minimum Spanning Trees*
  - *25 All-Pairs Shortest Paths*
  - *26 Maximum Flow*
- *IV Advanced Design and Analysis Techniques*
  - *15 Dynamic Programming*
  - *16 Greedy Algorithms*
- *VII Selected Topics*

Task for the students non-experienced in algorithm analysis:

I. *Choose **two** algorithms (interesting to you and not considered in the course) from the above-mentioned book sections.*

II. *Analyse the chosen algorithms in terms of time and space complexity, design technique used, etc. Implement the algorithms and produce several experiments. Analyse the results.*

Task for the students well-experienced in algorithm analysis:

I. *Choose an algorithm (interesting to you and not considered in the course) from the above-mentioned book sections.*

II. *Choose an algorithm interesting to you and proposed at most 10 years ago in a research paper for solving a certain practical problem (including optimization algorithms, graph algorithms, etc.).*

III. *Analyse the chosen algorithms in terms of time and space complexity, design technique used, etc. Implement the algorithms (or use the existing ones from the research paper) and produce several experiments. Your experiments should differ of those in the research paper. Analyse the results.*

Further reading (the book):

II Sorting and Order Statistics

III Data Structures

V Advanced Data Structures

VII Selected Topics

34 NP-Completeness