Exercise No. 5.

Topic: Dynamic programming

Requirements:

1. Knowledge of dynamic programming method (PD).

2. Knowledge of the exhaustive search method - Brute Force alg. BF.

3. Knowledge of the computational complexity of both of the above methods.

4. Knowledge of the formulation of the Knapsack problem.

5. Approximation algorithms (greedy like)

Instruction:

1. Knapsack problem.

2.Solve problem from point 1. Employing the dynamic programming algorithm. Compare the effectiveness of the obtained solution with other algorithms: exact – exhaustive search solution space BF and greedy algorithm, measuring the time to obtain a solution for all methods, for the same problem instances. Provide a comparative graph of the methods used.

3. Compare the quality of the solutions obtained(optimal versus approximate). Provide conclusions and comments

4. Formulate conclusions on the effectiveness of the methods used for their computational complexity. Give the belonging of the studied problem to a specific complexity class of problems due to its computational complexity.

Duration: 2 weeks