

Ex # 4

Topic: Backtracking Algorithms

Requirements:

- the idea of backtracking algorithms,
 - problems finding the Eulerian and Hamiltonian cycle in undirected graphs and their belonging to appropriate the complexity classes,
 - the backtracking algorithm for the problem of finding a Hamilton cycle.
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1. For a randomly generated connected graph (check connectivity) and with edge saturation ($k = 0.2, 0.3, 0.4, 0.6, 0.8, 0.95$) (n - vertices), find the Euler cycle (CE). Graph $t = f(n)$ - CE for a search time. Justify the choice of graph representation. Give the advantages and disadvantages of the selected representation in comparison with the others.
 2. For a randomly generated connected graph (check connectivity) and with edge saturation ($k = 0.2, 0.3, 0.4, 0.6, 0.8, 0.95$) (n - vertices) look for a Hamilton cycle (CH). Graph $t = f(n)$ - for a search time CH (average of at least 10 measurements).
 3. Based on the above tests, formulate conclusions regarding the complexity of the problems solved and the algorithms used.