Tecnológico de Monterrey

Fundamentos de computación

Homework 9

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1 Problems

Solve the following problems:

1. What is a P problem?
2. What is an NP problem?
3. What is and NP - complete problem?
4. Why P = NP is considered an open problem?
5. What is the difference between a decision problem and an optimization problem?
6. Investigate the 2-dimensional packing problem, describe the problem, and state it as a decision problem and then as an optimization problem?
7. Describe a simple heuristic (approximation algorithm) for solving the 2-dimensional packing problem. How could you measure the effectiveness of this heuristic for solving the problem?
8. Can you describe the Travelling Salesman Problem? How is this problem related to the Hamiltonian Cycle? Provide a polynomial transformation between those problems. How are these problems related to the Vehicle Routing Problem?
9. What is a phase transition?
10. How is a phase transition related to the easiness or hardness of NP problems?