CSCI_570 Exam 3 2007 Summer

[FALSE]

If A is linear time reducible to B (A _ B), and B is NP-complete, then A must be NP-complete.

[FALSE]

If B is linear time reducible to A (B _ A), and B is NP-complete, then A must be NP-complete.

[TRUE]

If any integer programming optimization problem can be converted in polynomial time to an equivalent linear programming problem, then P = NP.

[FALSE]

It has been determined that NP Complete problems cannot be solved in polynomial time.

[FALSE]

If P = NP, then there are still some NP complete problems that cannot be solved in polynomial time.

[TRUE]

When we say that a problem X is NP Complete, then it means that every NP complete problem can be reduced to X.

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[TRUE/FALSE]FALSE

In a flow network whose edges have capacity 1, the maximum flow always corresponds to the maximum degree of a vertex in the network.

[TRUE/FALSE]FALSE

If all edge capacities of a flow network are unique, then the min cut is also unique.

[TRUE/FALSE]TRUE

A minimum weight edge in a graph G must be in one minimum spanning tree of G.

[TRUE/FALSE]TRUE

When the size of the input grows, any polynomial algorithm will eventually become more efficient than any exponential one.

[TRUE/FALSE/UNKNOWN]FALSE

NP is the class of problems that are not solvable in polynomial time.

[TRUE/FALSE/UNKNOWN]FALSE

If a problem is not solvable in polynomial time, it is in the NP-Complete class.

[TRUE/FALSE/UNKNOWN]TRUE

Linear programming can be solved in polynomial time.

[TRUE/FALSE] FALSE

$10^{2 \log 4n+3} + 9^{2 \log 3n+21}$ is O(n).

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[TRUE]

If NP = P, then all problems in NP are NP hard

[FALSE]

L1 can be reduced to L2 in Polynomial time and L2 is in NP, then L1 is in NP

[FALSE]

The simplex method solves Linear Programming in polynomial time.

[FALSE]

Integer Programming is in P.

[FALSE]

If a linear time algorithm is found for the traveling salesman problem, then every problem in NP can be solved in linear time.

[TRUE]

If there exists a polynomial time 5-approximation algorithm for the general traveling salesman problem then 3-SAT can be solved in polynomial time.

[FALSE]

Consider an undirected graph G=(V, E). Suppose all edge weights are different. Then the longest edge cannot be in the minimum spanning tree.

[FALSE]

Given a set of demands D = {dv} on a directed graph G(V,E), if the total demand over V is zero, then G has a feasible circulation with respect to D.

[TRUE]

For a connected graph G, the BFS tree, DFS tree, and MST all have the same number of edges.

[FALSE]

Dynamic programming sub-problems can overlap but divide and conquer sub-problems do not overlap, therefore these techniques cannot be combined in a single algorithm.