
CS1340: DISCRETE STRUCTURES II

PRACTICE QUESTIONS IV

- (1) Suppose 1000 people enter a chess tournament. Use a rooted tree model of the tournament to determine how many games must be played to determine a champion, if a player is eliminated after one loss and games are played until only one entrant has not lost. (Assume there are no ties.)
- (2) Every tree $T = (V, E)$ with $|V| \geq 2$ has at least two vertices that have degree 1.
- (3) Prove that a graph with distinct edge weights has a unique minimum spanning tree.
- (4) Let x and y be two nodes of a binary tree B . Prove that x is an ancestor of y iff x stands before y in the pre-order traversal of B and x stands after y in the post-order traversal of B .
- (5) Suppose you are given a weighted undirected graph G and its MST T . Give an algorithm that finds the second MST - that is the algorithm should return the spanning tree of G with smallest total weight except of T .

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