Tutorial 9: CS21003 Algorithms I

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1. Let $G = (V, E)$ be a weighted undirected graph where the edge weights are either 1 or 2. Develop an efficient algorithm for finding the Minimum Spanning Tree of G. Analyze the complexity.
2. Let $G = (V, E)$ be a weighted directed graph that has exactly one negative weight edge. All other edge weights are positive. Present an efficient algorithm to find the shortest cost path from node s to node g.
3. Given a weighted directed acyclic graph, present a depth-first search-based traversal algorithm that finds the lengths of the longest directed paths between every pair of nodes. If no directed path exists, indicate it by -1. Analyze the time and space complexities of your algorithm.