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Title: Lengthy Description

Tag: Graph Theory

Description: Graph theory is a fundamental area of discrete mathematics and data structures that studies graphs, which are mathematical representations of networks consisting of vertices (or nodes) and edges (connections between the nodes). In data structures and algorithms (DSA), graphs play a crucial role in modeling relationships and interactions, such as social networks, transportation systems, and web page links. Key concepts in graph theory include traversals (like depth-first search and breadth-first search), shortest path algorithms (like Dijkstra's and Bellman-Ford), and minimum spanning tree algorithms (like Prim's and Kruskal's). These concepts enable efficient problem-solving for a variety of applications, such as route optimization, network design, and connectivity analysis. Understanding graph theory is essential for developing efficient algorithms and data structures that can handle complex relational data.