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DS 210

Project Report

This code reads in a directed graph from a file then computes the average shortest path length and diameter of the graph using the Breadth-First Search (BFS) algorithm. The read_graph function reads the graph from a file and constructs an adjacency list representation, where each key in the HashMap represents a node in the graph and the corresponding value is a vector of the node's neighbors. The compute_avg_shortest_path_length function computes the average shortest path length between all pairs of nodes in the graph using BFS, and the compute_diameter function computes the diameter of the graph using BFS as well.

This code is helpful because it provides a way to analyze the structure of a social network and understand its properties. The average shortest path length can indicate the degree of separation between nodes in the network, and the diameter provides information about the maximum distance between any pair of nodes. These metrics can be useful for understanding how information or influence might flow through the network and can inform strategies for targeting influential nodes or identifying potential bottlenecks.

The Epinions.com data set is a relevant and interesting data set to use for this analysis because it represents a real-world social network with trust relationships between users. The trust relationships and review ratings are combined to determine which reviews are shown to users, so understanding the structure of the network could potentially have implications for the quality of the reviews that users see.