CS140 - Group Assignment 9

Due: Friday, April 5 at 10pm

1. Dijkstra's algorithm is not guaranteed to compute the correct shortest path lengths if a graph has negative weight edges. However, there might be special types of graphs on which Dijkstra's is guaranteed to get the correct answer even if there are negative weight edges. Is a directed acyclic graph (DAG) one such example? In other words, if the graph is a DAG, will Dijkstra's always compute the correct shortest paths regardless of whether or not there are negative weight edges? Explain.

2. Johnson's algorithm calculates an h function for calculating a reweighted graph. The output of the h function is always less than or equal to zero. Explain why.

3. The slides currently posted have an error in the Floyd-Warshall example. If you look at the final d matrix, the shortest path from 5 to 2 is infinity, but there is a path of length 4 in the graph. Figure out where the mistake is made and update the d matrices on the algorithm example.

4. What's the best advice you've gotten about college and where did you get the advice? (this could be related to any aspect of the college experience: applying, attending, choosing a major, school/life balance, etc)