CS305: Homework 4

Assigned: Tuesday, April 23, 2024
Due: Tuesday, April 30, 2024

- Do all of the following problems. **Show your work**. Homework submissions must be emailed to me **as a pdf**. Typed submissions are appreciated, but not required.
- You may work with others on the homework, but you **MUST** acknowledge the people you worked with at the top of your homework submission. Do **not** look at the web for solutions to homework problems. Looking for solutions does **not** help your problem solving powers.

Problems

Note that the book separates things into exercises and problems with exercises appearing at the end of a section and problems (which tend to be longer) appearing at the end of the chapter.

1. Exercise 22.3-2 Example of Dijkstra's w/ negative weight edges ... The question at the end is Extra Credit: Why doesn't the proof ...
2. Problem 22-3 Arbitrage. Hints: consider converting the problem into a shortest path problem and using a modified Bellman-Ford w/ NWC detection to solve it. Since shortest path problems add weights of edges together and the problem shows a series of multiplications, recall log(a*b) = log(a) + log(b). Further know that, log(1) = 0. There's still more needed, but those hints should help you to get you started.
3. Exercise 23.3-4 What is wrong with a certain Johnson's reweighting idea.
4. Exercise 23.3-6 Do the first part only which is about a different source vertex idea for Johnson's. Do not do the part that starts "Then show that if G is strongly connected ..."