

CS305: Homework 4

Assigned: Monday, December 5, 2022

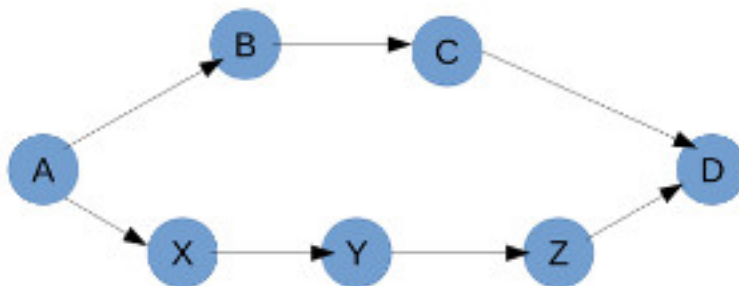
Due: by 5 p.m. on Friday, December 9, 2022

- 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 19.3-2
2. Exercise 20.2-4, also write out the line(s) of pseudocode of this modified BFS. State clearly which line(s) would change from the BFS algorithm given in section 20.2 and what those line(s) would change to.
3. List all the topological sort orderings for the following graph.



4. 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.