

Homework 5, Due day: April 13

All solutions should be typed, using Latex preferably (suggested to use Overleaf software).

(1) Problem 1 (a), (b), (c), and (d) of the final test of 2021.

(2) Chapter 8, 2

(3) Chapter 8, 4

(4) Chapter 8, 5

(5) Longest Path ask if there is a simple path which contains at least K edges in G . Show that Longest Path is NP-complete by reducing Hamiltonian Path to Longest Path. (You need to show that Longest Path is in NP.)

(6) Refer to card game (the second last page of the second set of slides) with two players A and B. Suppose A is the first player. Given n (number of cards), write a pseudo for a winning strategy (for A) and then program the strategy. Show the interactions between A and B (via program outputs). Your program also allows choices from B. If there is no winning strategy for A, the program just prints "no winning strategy". Show cases for $n=10$, 21, and 50.