

Homework F

- **Due: Thursday, February 11, before class**
- Please refer to the syllabus for homework policies. (Points of interest include late policies, typesetting, collaboration, extra-credit stuff...)
- If you explicitly do not want your submission to be considered as a solution key, please state so clearly at the top of your submission. If you explicitly want to remain anonymous (if selected), please state so clearly at the top of your submission.
- If you use dynamic programming in your solution, please address the steps outlined in the typed notes.
- There are also some online problems on Gradescope, to be done individually and due at the same time as this word problem. (Note that there is no late policy for these problems.)
- If the topics in this lecture were new to you, then we recommend exercises 5, 7, 8, and 26 from Chapter 12 of Jeff's notes.
- There is no need to include your PUID on the submission thanks to Gradescope; it actually makes it a little trickier for us when putting out solution keys.

Problems

1. (a) Recall that a 5-coloring of a graph G is a function that assigns each vertex one of 5 different colors, such that no two adjacent vertices have the same color. In class we showed that a polynomial time algorithm for 3-coloring implies a polynomial time algorithm for 3-SAT. Show that a polynomial time algorithm for 5-coloring also implies a polynomial time algorithm for 3-SAT.
(b) Exercise 24 in Chapter 12 of Jeff's notes.