

COSC 311: ALGORITHMS

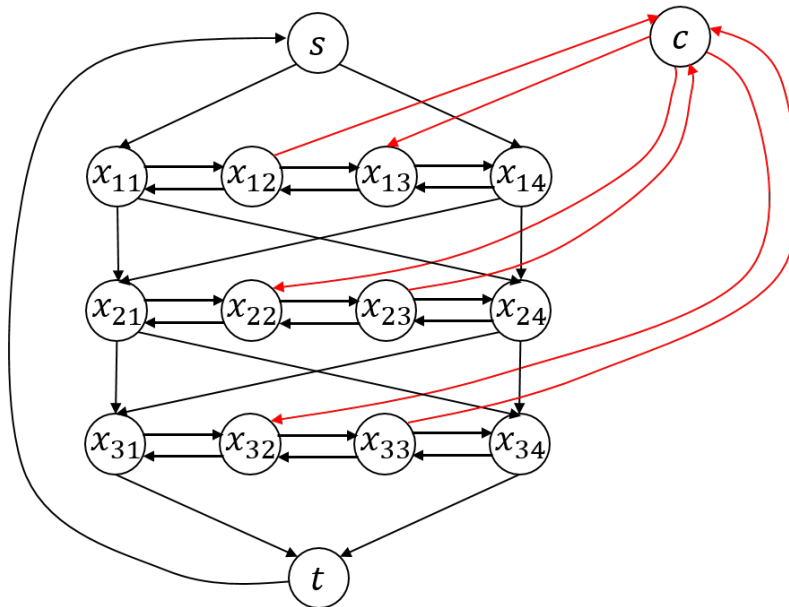
MINI 12

Due Wednesday, December 12 in class

Here's a (very tiny) instance of 3-SAT:

$$x_1 \vee \bar{x}_2 \vee \bar{x}_3$$

And here's a graph corresponding to the Hamiltonian Cycle instance we created in our reduction (some of the edges are in red just to make the graph easier to read):



This mini homework is about showing that there's a mapping between "yes" instances of 3-SAT and "yes" instances of Hamiltonian cycle.

1. Find a Hamiltonian cycle in this graph. Explain how you can use this cycle to find a satisfying assignment for the original 3-SAT instance.

2. One possible satisfying assignment for the 3-SAT instance is $x_1 = \text{false}$, $x_2 = \text{true}$, $x_3 = \text{false}$. Explain how you can use this satisfying assignment to find a Hamiltonian cycle in the graph created in the reduction.