

HW 11 out due Tue after break ← last HW

NO GPS due Mon after break

Might be short GPS after break

CAs for next semester

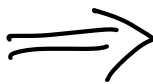
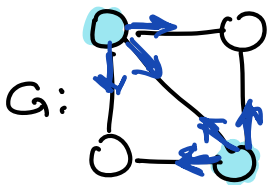
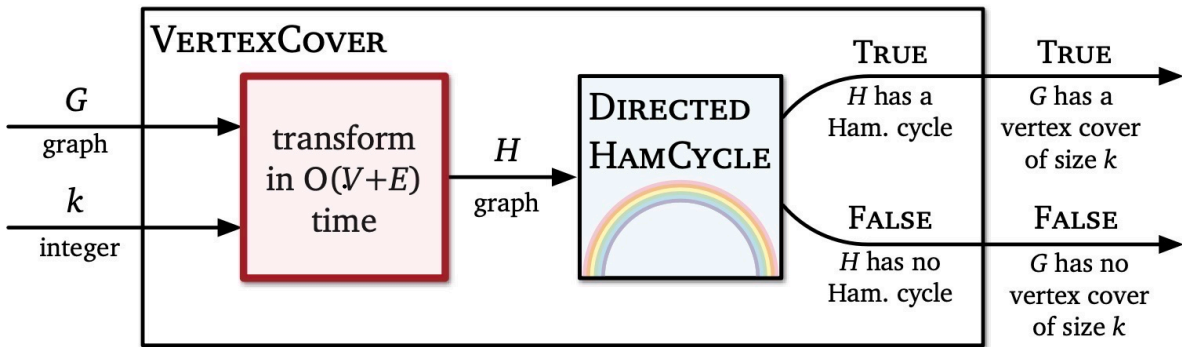
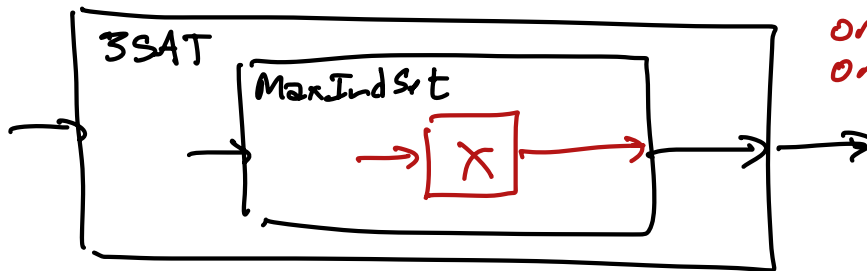
After break: Conflict form for final exam Fri Dec 8 - 8am

No HW parties this Sat or next Sat or Dec 7 ↪ MKN review

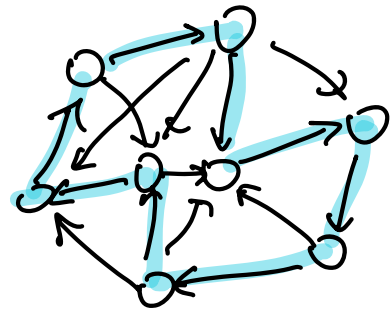
My office hours Wed 4→5 ⇒ 3-4 and after 5

X is NP-hard iff solving X in poly time ⇒ $P=NP$
iff there is a poly time reduction from 3SAT to X

or MaxIndSet
or VertexCover
or MaxClique



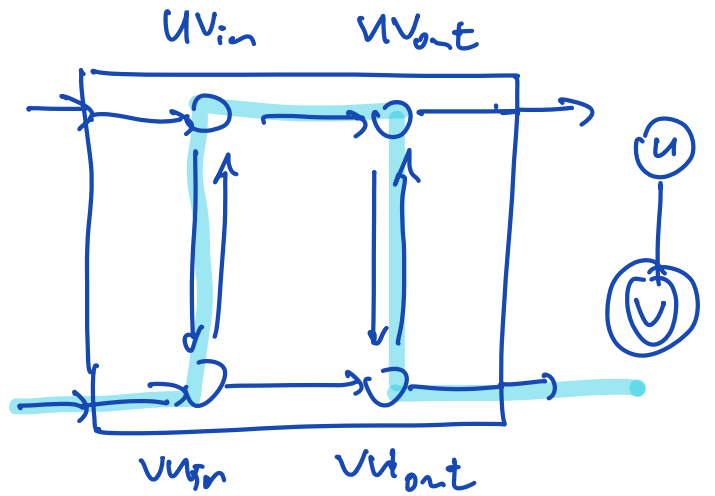
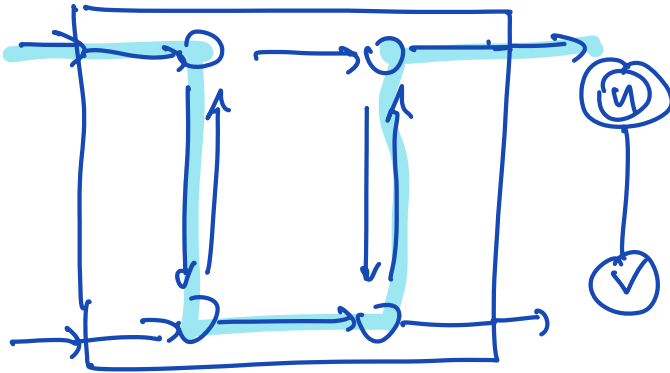
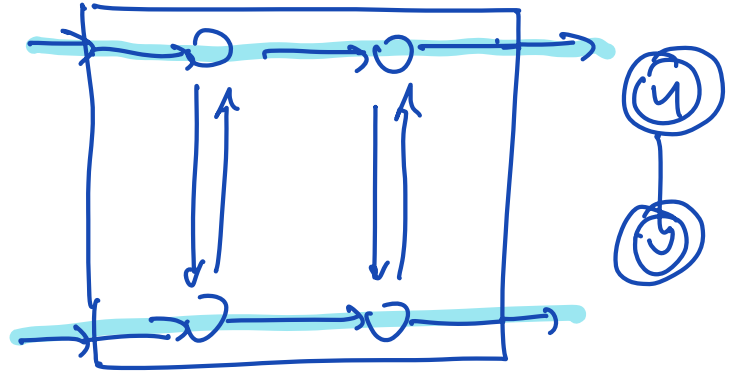
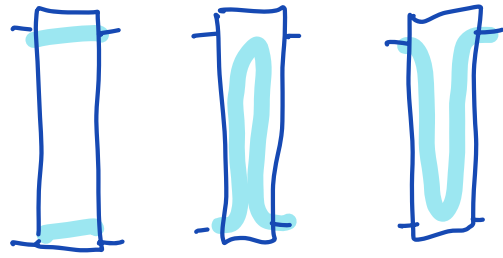
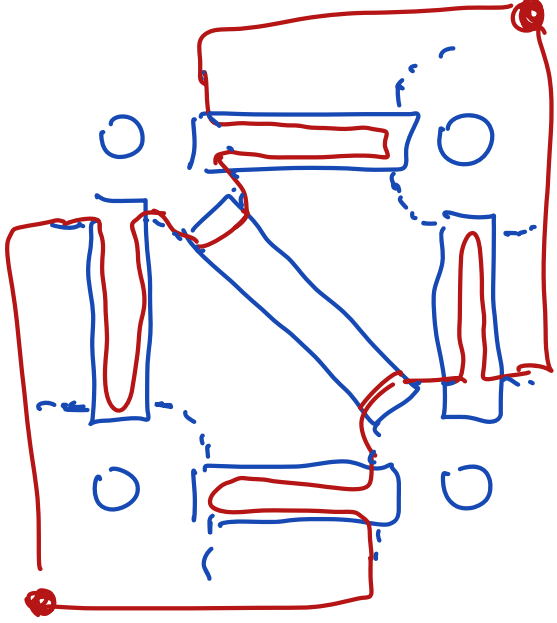
$H:$

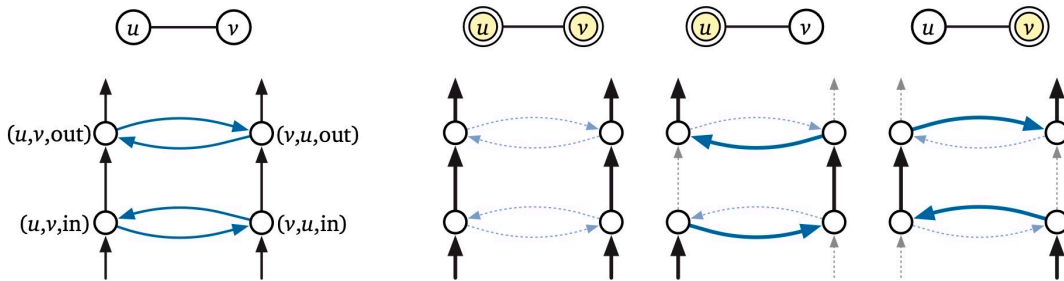
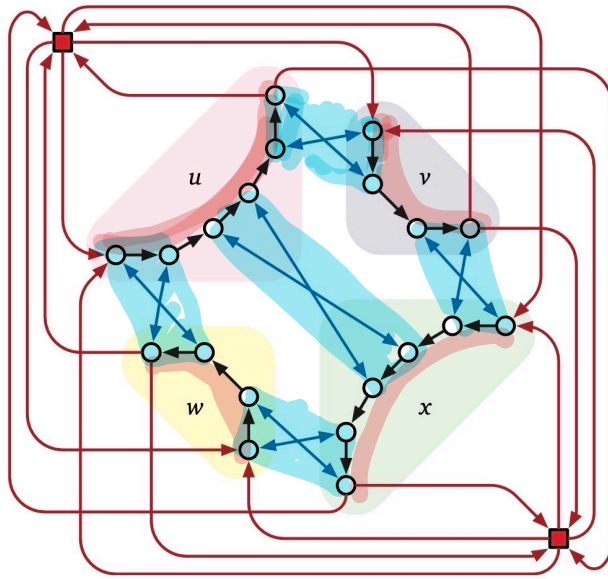
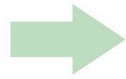
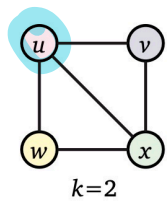


$VertexCover(G, 2) = TRUE$
 $VertexCover(G, 1) = FALSE$

vertex gadgets
edge gadgets

cover vertex

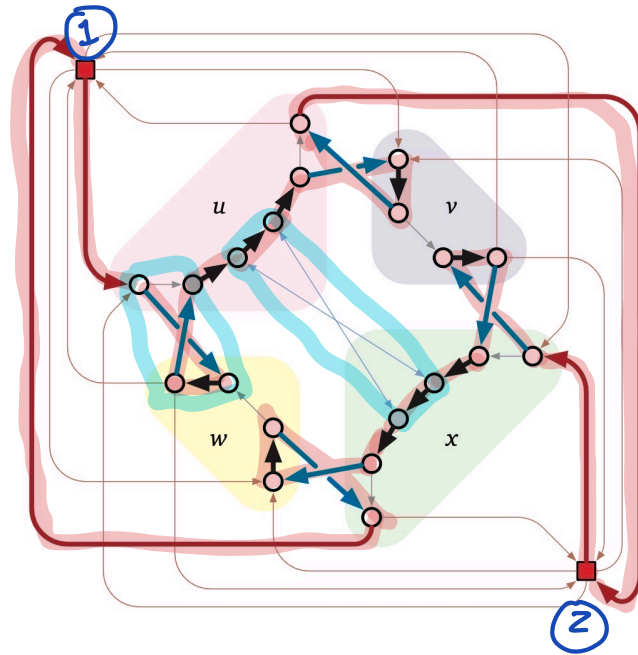
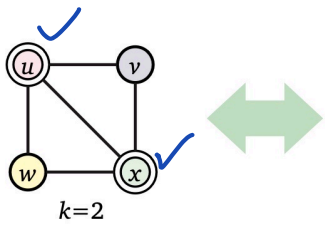
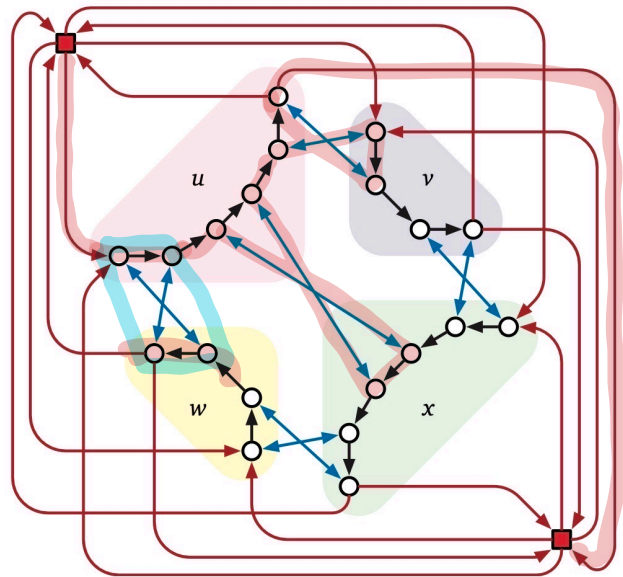
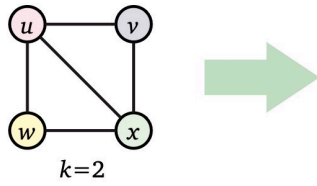


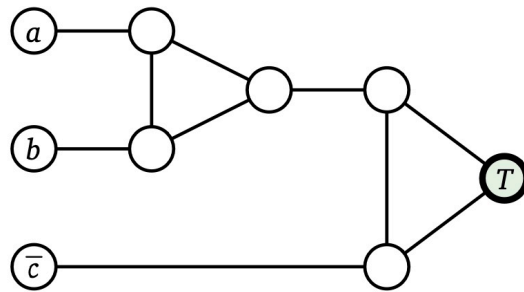
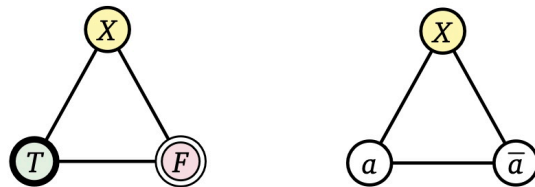
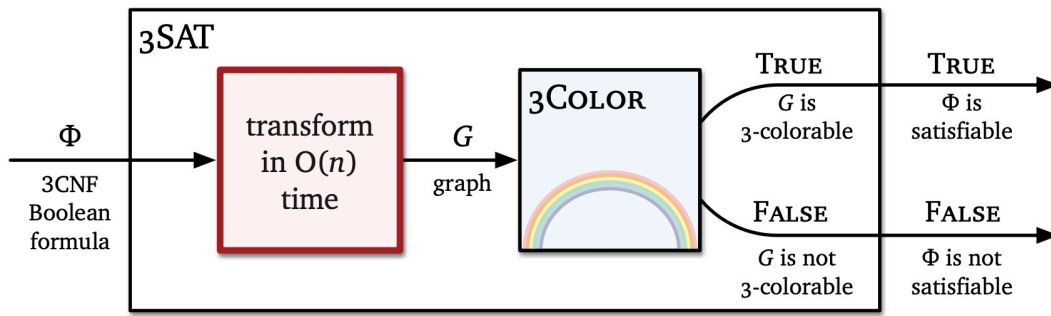


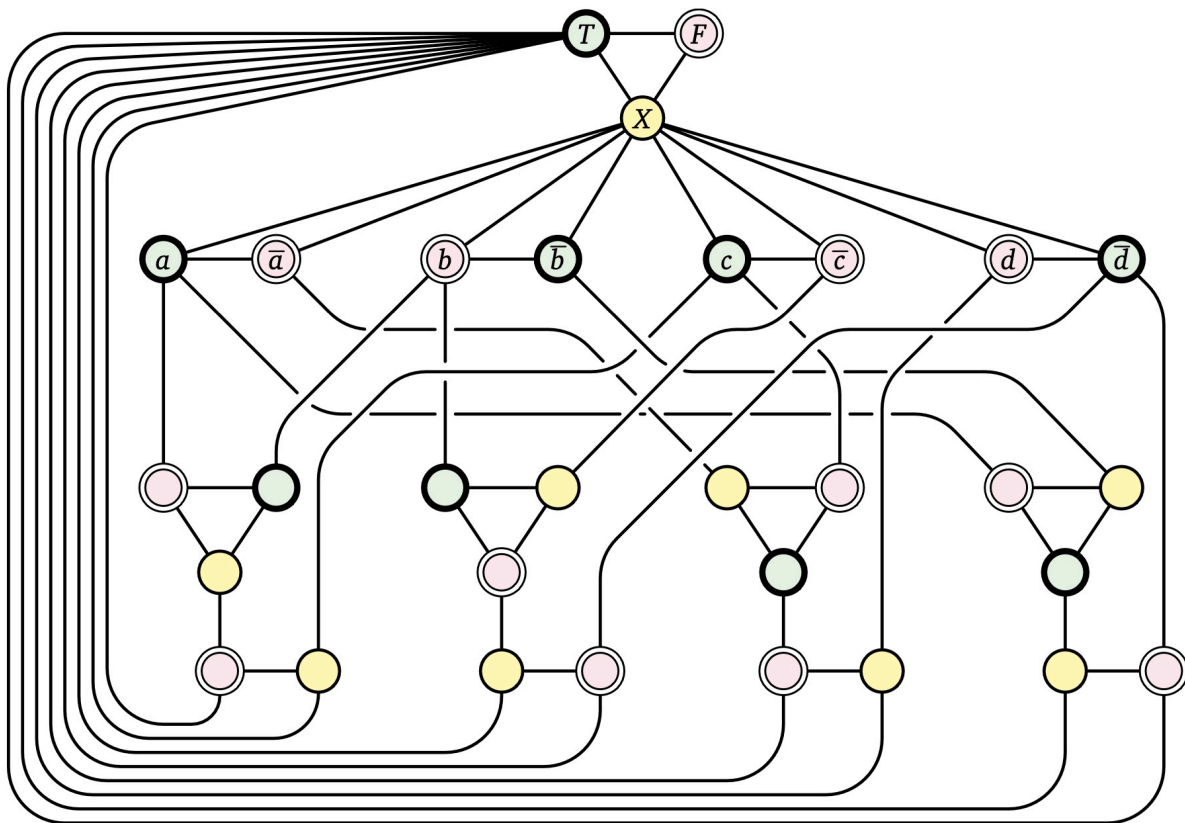
We are trying to establish a correspondence between vertex covers S in G and Ham.cycles C in H

G	H
vertex	vertex path
edge	edge gadget
$v \in S$	C uses v 's vertex path
uv s.t. $u, v \in S$	C enters both ends of uv 's edge gadget
uv s.t. $u \in S, v \notin S$	C enters uv 's gadget at u 's end, crosses over to v 's end, crosses back and leaves from u 's end
# vertices in S	# vertex paths traversed by C = # cover vertices

IF ham cycle in H uses v 's vertex gadget, mark v in G .
 ham cycle \rightarrow touches every edge gadget
 \rightarrow every edge has at least one marked vertex







$$(a \vee b \vee c) \wedge (b \vee \bar{c} \vee \bar{d}) \wedge (\bar{a} \vee c \vee d) \wedge (a \vee \bar{b} \vee \bar{d})$$

