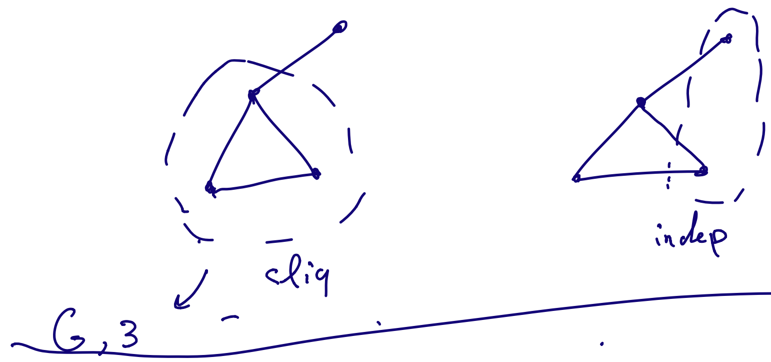
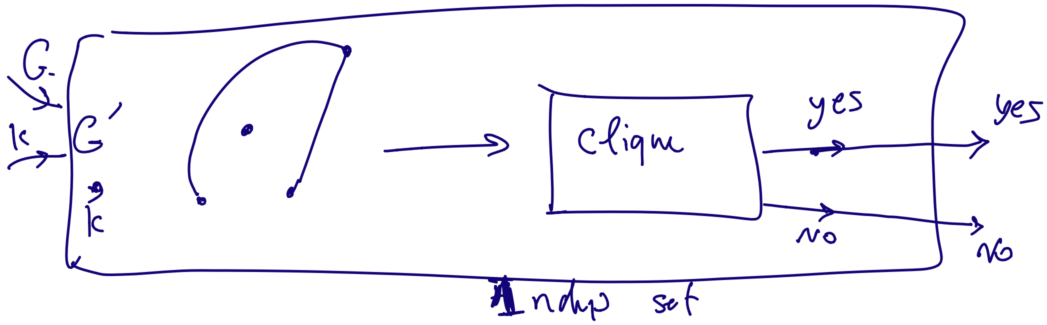




Bipa max match $\le_p$ General graph max matching

max ind on trees $\le_p$ max ind set on graphs

---

pf of correctness:

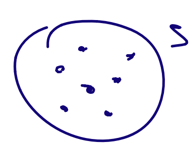
Claim: G has indep set of size $\geq k$ $\Longleftrightarrow$ G' has a clique of size $\geq k$.

$\Longrightarrow$

G has ind set S s.t. $|S| \geq k$.

So S is a cliqu in G'

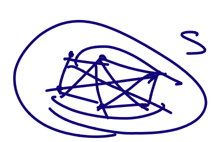
So G' has a clique of size $\geq k$.



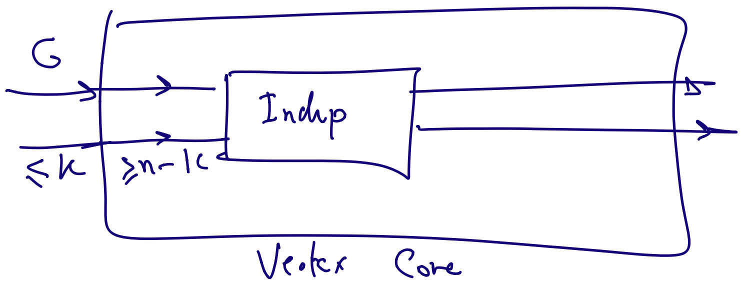
$\Longleftarrow$

G' has a clique S s.t. $|S| \geq k$

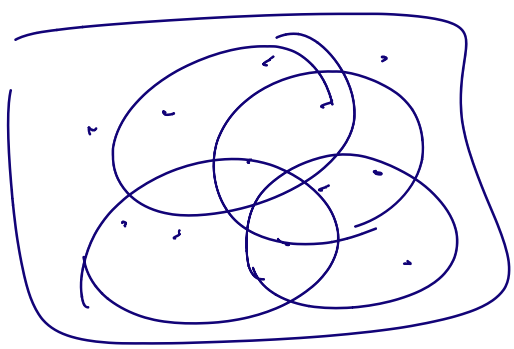
So S is a indep set in G



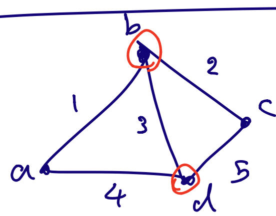
So G has an indep set of size $\geq k$.



* S is a vertex cover if for every edge ≥ 1 endpoint is in S.
* S is an indep set if for every edge ≤ 1 endpoint in S.



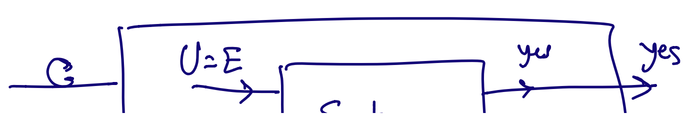
e.g.

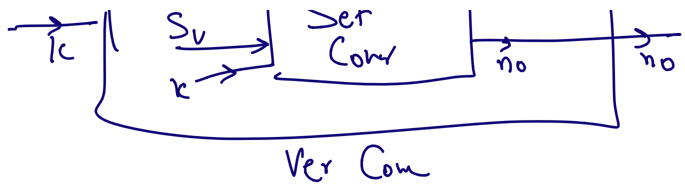


$\{1, \ldots, 5\}$

$S_a = \{1, 4\}$ $S_b = \{1, 2, 3\}$ $S_c = \{2, 5\}$ $S_d = \{3, 4, 5\}$.

S_b and S_d cover $\{1, \ldots, 5\}$





$\Rightarrow$

Correctness: Supp Vertex Cov (G,k) = yes. S is a vertex cover of G of size $\leq k$.

For all $v \in S$, add S_v.

BC S is a vertex, it covers all edges. So $\bigcup_{v \in S} S_v$ covers all elmts of set cov instance as well.

$\Leftarrow$ Supp Set Cov $(E, \{S_v\}_{v \in V}, k)$ = yes.

meaning that $S_{v_1} \dots S_{v_\ell}$ cover all elmts & $\ell \leq k$

Then $v_1, \dots, v_\ell$ cover all edges of G.