CSE491/596 Lecture Fri 10/28/22 continued.

Example Problem: IND SET:

INSTANCE: A graph G and a number $K > 0$

QUESTION: Do there exist (at least) K independent vertices, ie. no pair connected by an edge?

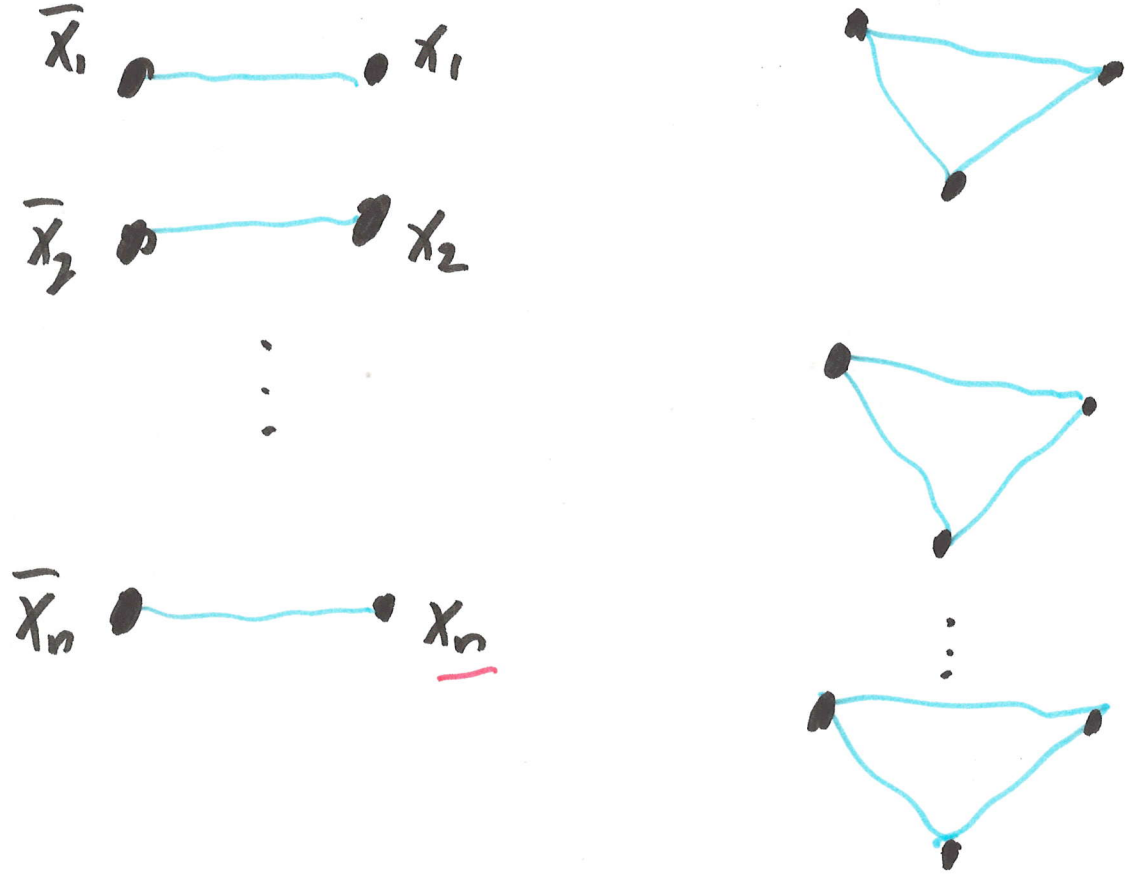
This is in NP. To show it NP-complete, show $3SAT \leq_m^p$ INDSET

$\phi \xrightarrow{f} \langle G, K \rangle$

I.e. we map

$C_1 \wedge C_2 \wedge \cdots \wedge C_i \wedge \cdots \wedge C_m$ in n variables $x_1, \ldots, x_n$ $\xrightarrow{f}$ $G = (V, E)$ and a number K that usually depend on n.

such that ϕ has a sat. assgt $\iff$ G has and ind. set of size K.



And take $K = m + n$

which is the max possible ind. set size with the blue edges present.