Reduction From HC to TSP

To show that TSP is NP-complete

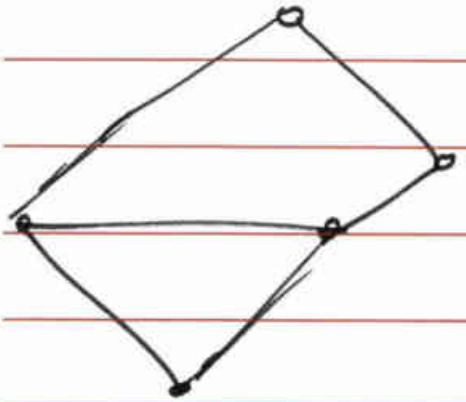
1- Show TSP is in NP

Certificate: a tour of cost at most D.

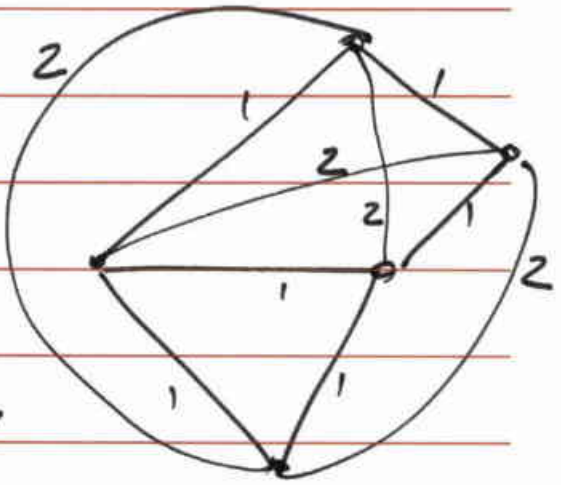
Certifier: Same as the certifier in HC prob. + cost of tour $\leq D$. ✓

2- choose HC

3- Show that $HC \leq_p TSP$



G



G'

Show that G has a HC iff G' has a tour of cost n.

If G has a HC ⇒ cost of the tour in G' can be $\underline{\eta}$.

If G' has a tour of cost $\underline{\eta}$
⇒ we can find a HC in G.

NP-complete problems:
Vertex Cover, Indep-set, Set cover,
3-SAT, TSP, Ham. Cycle
0-1 knapsack, subset-sum