

Set 3: Problem Transformation

$$I_{HC} \sim \begin{matrix} \gamma & \gamma \\ N \times & N \times \end{matrix} \stackrel{?}{=} \boxed{Rules} \stackrel{?}{=} I_{TSP} \sim \begin{matrix} \gamma & \gamma \\ N \times & N \times \end{matrix}$$

$$I_{TSP} = f(I_{HC})$$

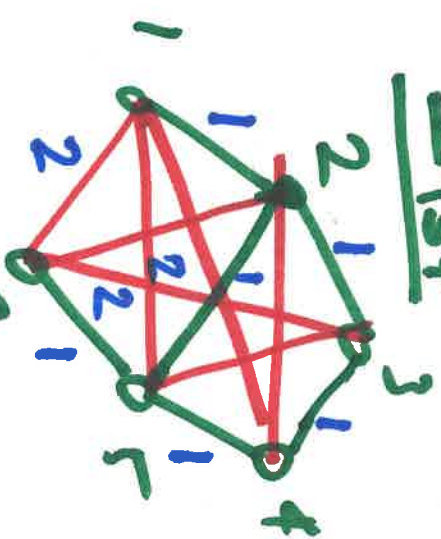
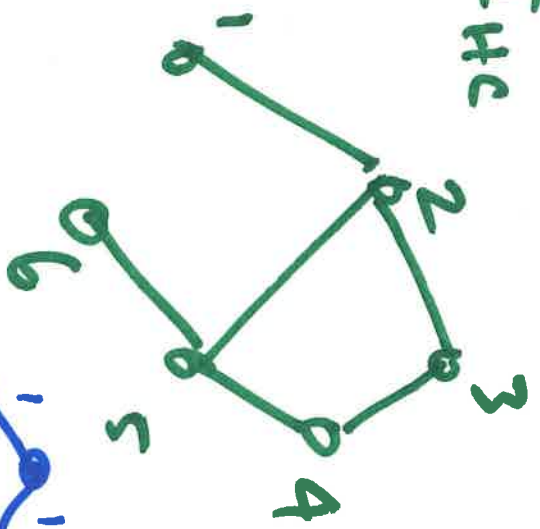
$O(n^2)$

Rules.

$$\frac{I_{TSP}}{I_{HC}}$$

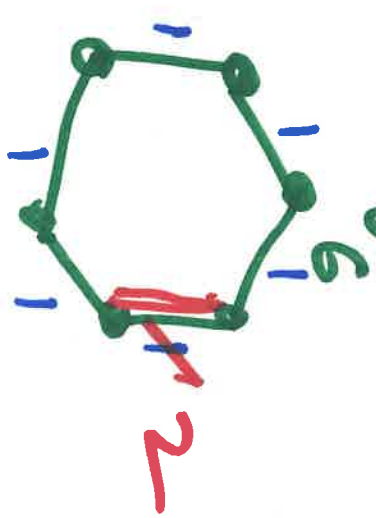
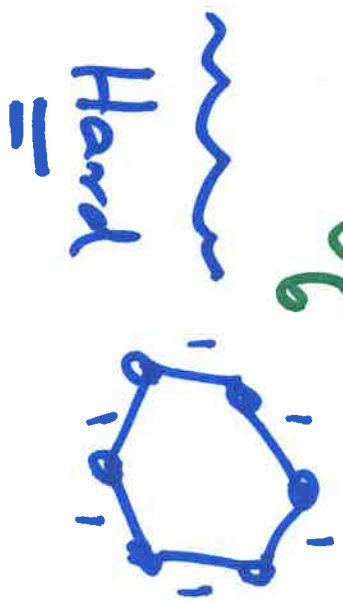
$O(n!)$

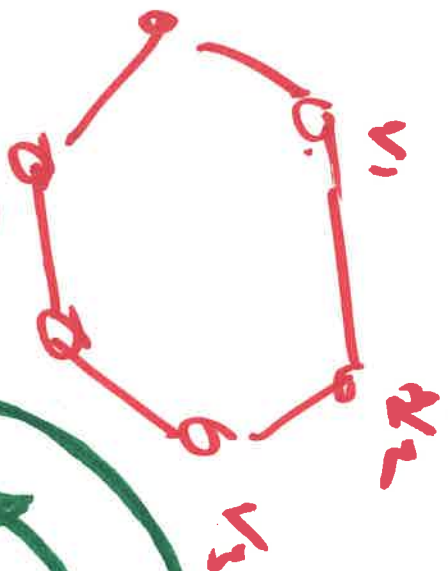
I_{HC}



$$B = 6 = n$$

$$\underline{n+1}$$





Rules \rightarrow :

HC

$$G = (V, E)$$

Q: Is there a HC? $\sim N$

Hard

1 century

~~Easy~~



TSP

$$Q = (V, E) \quad d(v_i, v_j) =$$

B

Q: Is there a tour of length $\leq B$ $\sim N$

All 1 century.

~~Hard~~

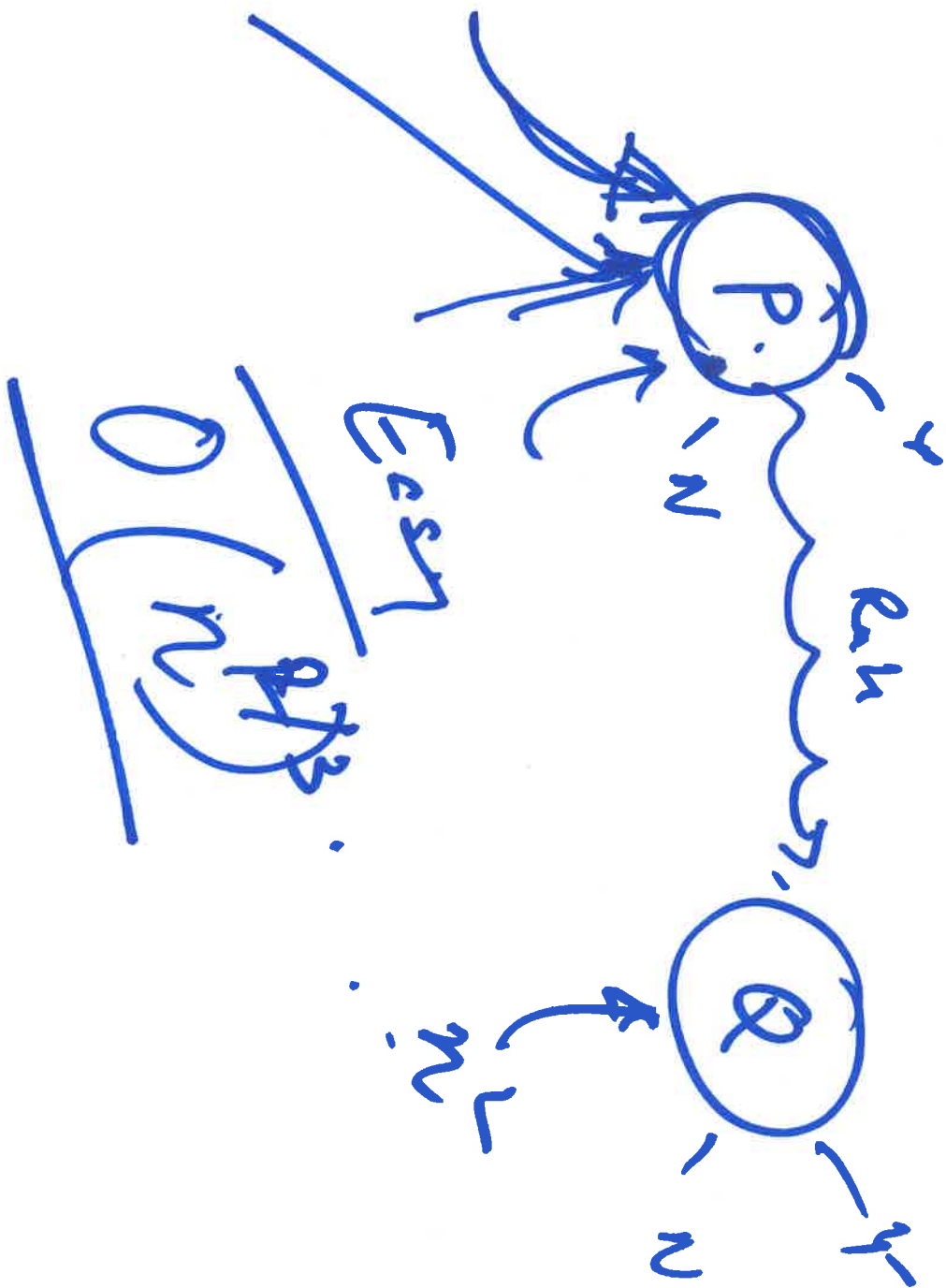
Easy

Hard = ?

$$O(n^2)$$

Unknown

$$\begin{array}{ccc}
 I_{HC} \begin{array}{l} \diagup \quad \diagdown \\ N \quad W \end{array} & \xrightarrow{R_{HL}} & I_{TSP} \begin{array}{l} \diagup \quad \diagdown \\ N \quad W \end{array} \\
 & & \\
 I_{TSP} = f(I_{HC}) & & \\
 \underline{\underline{R_{HL}}} & &
 \end{array}$$



Thinking Time + Execution Time

