Introduction to Computation and Complexity
Exercise Sheet 5

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Exercise 1

Prove that $\texttt{ISOMORPHISM} = \{G \# H \mid G \text{ and } H \text{ are isomorphic graphs.}\} \in \texttt{NP}$. Note that there is no known proof of this problem being NP-complete.

Hint 1: design a binary encoding of graphs.

Hint 2: find a certificate.

Exercise 2

Prove that $\texttt{SUBSETSUM} = \{\{x_1, \ldots, x_n\} \# t \mid \exists i_1, \ldots, i_k \in \{1, \ldots, n\}$ such that $\forall j \neq j', i_j \neq i_{j'}$ and $x_{i_1} + \ldots + x_{i_k} = t\} \in \texttt{NP}$.