Exercise Solution: P and NP

1. Consider the following problems, give a certificate that helps proving the NP membership.

   (a) PARTITION $= \{\langle S \rangle | S = \{x_1, x_2, \cdots, x_k\}$ and there is a partition of $S, T = \{x_{i_1}, \cdots, x_{i_t}\} \subseteq S$ such that the sum in T is equal to the sum in $S \setminus T\}$

   (b) HAMPATH $= \{\langle G, s, t \rangle | G$ is a directed graph with a Hamiltonian path from s to $t\}$

2. Show that PARTITION is in NP.

3. Show that 3SAT is in NP.