Week 13 Tutorial Session

(1) Prove that the following languages are NP-complete:

  (a) $L_1 = \{\langle\varphi\rangle \mid \varphi$ is a boolean formula with at least two satisfying assignments$\}$

  (b) HALF-CLIQUE $= \{\langle G\rangle \mid G$ is a graph on n vertices containing a clique of size at least $n/2\}$

(2) Suppose some polynomial-time algorithm A decides the *decision* problem

$$\text{CLIQUE} = \{\langle G, k\rangle \mid \text{Graph } G \text{ contains a clique of size } k\}.$$

Using A, give a polynomial-time algorithm to search for a clique of size k in a graph G, whenever such a clique exists.