CSL 356: Analysis and Design of Algorithms
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1. Discuss Minor-2.

2. Consider the following problem:

   CLIQUE: Given a graph G and an integer k, determine whether G has a *clique* of size at least k. A clique in a graph is a subset of vertices such that all pair of vertices in the subset are connected with an edge.

   Show that INDEPENDENT-SET $\leq_p$ CLIQUE.

3. Consider the following problem:

   MAX-INDEPENDENT-SET-SEARCH: Given a graph G find an independent set of G with maximum cardinality.

   Recall, in the lecture, we showed that MAX-INDEPENDENT-SET $\leq_p$ INDEPENDENT-SET. The MAX-INDEPENDENT-SET problem was the following: given a graph G, find the size of the maximum independent set of G.

   Show that MAX-INDEPENDENT-SET-SEARCH $\leq_p$ INDEPENDENT-SET.

4. Consider the following problem:
   CLIQUE-AND-IS: Given a graph G and an integer k, determine if there is a clique of size at least k in G and an independent set of size at least k in G.

5. (*Search 3-SAT*) Suppose you are given an algorithm A for solving the 3-SAT problem. Can you use this algorithm to design another algorithm that finds a satisfying assignment if there exists one?

6. (*2-SAT*) Recall, we said in the lecture that 2-SAT is easy. Design an efficient algorithm for solving the 2-SAT problem. Why doesn't ideas for solving the 2-SAT problem extend to the 3-SAT problem.