CS46 Lab 12

Lab problems are an opportunity for discussion and trying many different solutions. They are **not counted towards your grade**, and **you do not have to submit your solutions.** The purpose of this lab is to get more practice with polynomial-time reductions.

1. Show that polynomial-time reductions are *transitive*; that is, show that if $A \leq_P B$ and $B \leq_P C$ then $A \leq_P C$.

2. Let *3-SAT* be the language that is like *SAT*, except that each clause must have three literals.

   (a) Show that *3-SAT* $\leq_P$ *SAT*.

   (b) Show that *SAT* $\leq_P$ *3-SAT*.

3. Recall that *INDEPENDENT-SET* $= \{\langle G, k \rangle \mid$ G is an undireccted graph that has an independent set of size at least k$\}$.

   Reduce *3-SAT* $\leq_P$ *INDEPENDENT-SET*.