

Honors Algorithms — G22.3520-010 Fall 2006 — Supplemental Problems

Here are some additional problems that you should show are NP-complete. We will discuss them in class next week. You don't need to hand them in.

1. *HALF-3SAT*.

Instance: a 3-CNF formula with k clauses, where k is even

Question: is there an assignment to the variables that satisfies exactly $k/2$ of the clauses?

2. *PARTITION*.

Instance: positive integers a_1, \dots, a_n , where $A := \sum_{i=1}^n a_i$ is even.

Question: is there a subset $I \subset \{1, \dots, n\}$ such that $\sum_{i \in I} a_i = A/2$?

3. *HALF-CLIQUE*.

Instance: an undirected graph $G = (V, E)$

Question: does G have a clique of size at least $|V|/2$