1. (4 points) Consider the following problem. We have a set of items A (called the universe), and we are given m subsets $B_1, \ldots, B_m \subseteq A$. The problem we study here is whether there exists a subset of items $H \subseteq A$ such that 1) each of the sets B_i has at least one element in common with this H (also called a *hit*) and 2) the size of H is at most k.

   Give *two* rules to reduce an instance of this problem *that are as general as you can think of* (without loss of optimality), and for each of these explain briefly why it is correct.

End of assignment