## CS 5633: Analysis of Algorithms

### Homework 10

1. It is possible to verify whether a subset of size at least k customers who haven’t bought the same product exists in polynomial time. So, this is NP. To prove this is Np-complete, we have to prove that this is NP-hard.

Independent Set(IS) is a known Np-hard problem. Given a graph G = (V, E) for IS, we will construct a set of customers and products in a way such that G will contain an independent size of size at least k if and only if there is a subset of k customers such that no two customers in this set bought the same product.