Theory of Computation Homework 1

313782 Gregory Richard
324944 Damian Kopp
350510 Kim Yujun

March 2022

Problem 1

We take $< G, k >$ in CLIQUE. Then, take a function f that transform G such that all non-connected nodes are removed and for every edge, we create an intermediate node. For example, for points P, Q and edge $\{P, Q\}$, we create intermediate node R and connect all between P, Q, R with edges. We than don't allow any of these intermediate nodes to lie in D. Then $< G, k > \in CLIQUE \iff f(< G, k >) \in DENSESET$

Problem 2

Take the smallest element in X and add its absolute value + 1, p, to every element in X, so you shift all elements to lie positive. Then also add $|X|$ times the value p into X. For the other way around, we don't have to do anything because $\mathbf{N} \subseteq \mathbf{Z}$