

# Homework Complexity IBC028

To be handed in on the exercise session of June 8, 2017.

This is the third and last set of homework exercises.

By handing in these homework exercises an extra bonus can be obtained for the examination: one full point if all three sets of homeworks exercises are done perfectly, and otherwise a corresponding part of one point.

## Exercise 1.

A CNF  $\phi$  is satisfiable if an assignment exists for which every clause in  $\phi$  is true. A CNF  $\phi$  is called pre-satisfiable if an assignment exists for which every clause in  $\phi$  is true, except for at most one. We want to prove that pre-satisfiability of CNFs is NP-complete.

- (a) Describe what has to be proven for this.
- (b) Give the proof.

## Exercise 2.

A set of nodes in an undirected graph is called *independent* if no two nodes of them are connected by an edge. Prove that the problem to decide whether for a given graph and a number  $k$ , the graph contains an independent set of  $k$  nodes, is NP-complete.