Homework 1

Algorithms on Directed Graphs, Winter 2018/9

Due: 2.11.2018 by 16:00

Exercise 1. Prove the followings:

(i) every strong tournament has a Hamiltonian cycle,

(ii) Use (i) to prove that there is a polynomial time algorithm to find a Hamiltonian path in tournaments.

Exercise 2. Let F be a minimum feedback arc set of G. Prove that the digraph obtained from G by reversing all of F arcs is acyclic.

Exercise 3. Recall the proof of Theorem FVS on Tournaments from the lecture note. Let Z be a subtournament of T obtained by adding X to the vertices in the longest common subsequence of $\mathcal{L}$ and $\mathcal{R}$. Prove Z is the largest acyclic subtournament of T containing all elements of X and no element of $S - X$.