

Fundamental Algorithms

WS 2017

Exercise Sheet 10

Exercise 1:

Show how to model the problem to compute a maximum matching in a bipartite graph as a maximum flow problem.

Exercise 2:

Show that the time needed to compute an augmenting path with maximum flow value is bounded by $O(|E| \log |E|)$ as stated on Slide 41 of Chapter 6.

Exercise 3:

Present an example in which a blocking flow is not a maximum flow (see also Slide 47 of Chapter 6).

Exercise 4:

Show for the proof of Lemma 6.30 on Slide 54 that there are exactly $|f^*| - |f|$ paths from s to t along edges e with $f^*(e) - f(e) = 1$.

Exercise 5:

(Challenge) Prove Lemma 6.31 on Slide 55 of Chapter 6.