Exercise Sheet 02

Deadline for submission is Friday May-13-22, 23.59h at your Olat course

Task 1

2 p.

Determine the asymptotic running time of Algorithms 2 ("Recursive DFS") in the lecture notes.

Task 2

2 p.

Determine the asymptotic running time of the following Algorithms:

Algorithm 1 Example Algorithm

Ensure: Graph G
 1: $ad = []$
 2: **for** $u \in G$ **do**
 3:     $sum = 0$
 4:     **for** $v \in N(u)$ **do**
 5:         $sum = sum + deg(v)$
 6:     **end for**
 7:     $ad[u] = sum/|N(u)|$
 8: **end for**
 9: $w(u) = 0 \,\forall w \in V(G)$
10: **for** $u \in G$ **do**
11:     **for** $v \in N(u)$ **do**
12:         **if** $w(v) < ad[u]$ **then**
13:             $w(v) := ad[u]$
14:         **end if**
15:     **end for**
16: **end for**

Task 3

2 p.

Proof: If two different circles in a graph G contain the same edge e, then a circle exists, which does not contain e.

Task 4

2 p.

Let T be a connected graph with no cycles. Then deleting any edge from T disconnects the graph.

Graph Theory
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Summer Term 2022
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Task 5

2 p.

Every Tree T of order $n \geq 2$ has at least two leafs.

Task	1	2	3	4	5	total
Points	2	2	2	2	2	10
reached						