Lehrstuhl für Informatik I
– Algorithmen und Komplexität –
Universität Würzburg
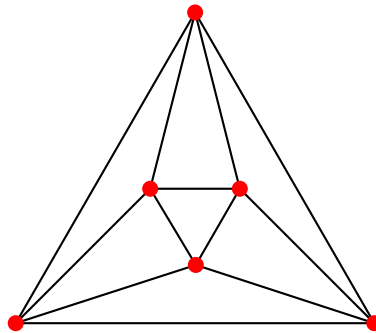
Würzburg, July 12, 2024

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Exercise Sheet #12

Graph Visualization (SS 2024)

Exercise 1 – Stack and queue layouts of the Octahedron

Let G be the Octahedral graph shown below.

a) What is the stack number of G? Argue why. Give a corresponding stack layout of G as a drawing. **5 Points**

b) What is the queue number of G? Argue why. Give a corresponding queue layout of G as a drawing. **5 Points**

Exercise 2 – Queue number of arched leveled-planar graphs

In the lecture you have seen that every leveled-planar graph has queue number 1. Show that also every arched level-planar graph has queue number 1. **5 Points**

Exercise 3 – Determining the size of the largest rainbow

Deciding if, for a given graph with a specified vertex-order, the queue number is at most k can be solved efficiently. It requires to determine the size r of a largest rainbow in polynomial time. Describe a polynomial-time algorithm to determine r. What is the running time of your algorithm? **5 Points**

This is a bonus assignment. If you want it to be graded, submit your solutions via WueCampus due at the beginning of the next lecture, that is, on July 19 at 10:15 am. The corrections will be after July 25. There will be no discussion of the solutions.