Algorithms and Data Structures 2
Winter term 2021
Martin Schobesberger, Stefan Grünberger
Dari Trendafilov, Markus Weninger

Deadline: **Tue. 25.01.2022, 23:59**

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Assignment 06

Maximal flows in graphs

Please don't change any skeleton we provide. Of course, you are allowed to add code in your classes, as long as you don't break the skeleton and their interfaces (method names and variables' types) we need for the unit tests to work correctly. **Please remember to fill out the time log survey in Moodle.**

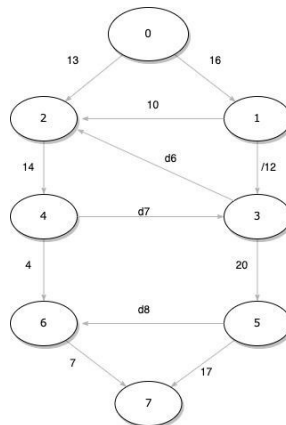## 1. Max Flow   8 points

Apply the **Ford-Fulkerson MaxFlow** algorithm (from vertex 0 to vertex 7), presented in the exercise using **pen & paper**.

Insert of student ID
Fill in the missing edge capacities using the digits of your student id as follows (if one of the digits is 0, then use 1 instead):
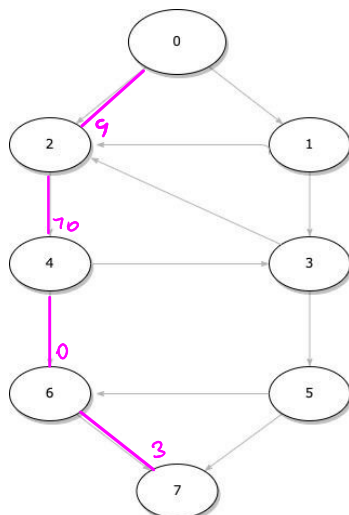
Student id: **k** X X X X X $\underset{d6}{7}$ $\underset{d7}{1}$ $\underset{d8}{8}$
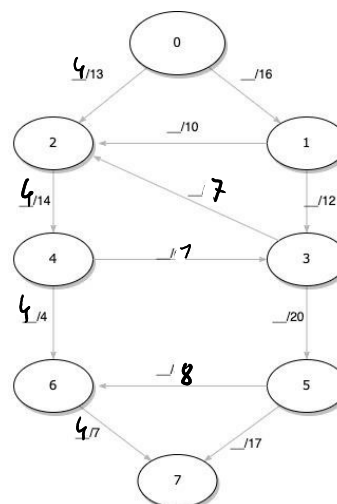

Perform the following tasks on the given network, assuming no existing flows in the beginning.
a) **Complete the residual graph** (i.e., add missing edges) and fill in its capacities,
b) **highlight your chosen augmenting path** (with any color and/or bold lines) in the residual graph,
c) and **update the current flows** by the maximum possible flow according to your chosen path.
Repeat these tasks in 4 consecutive iterations below:

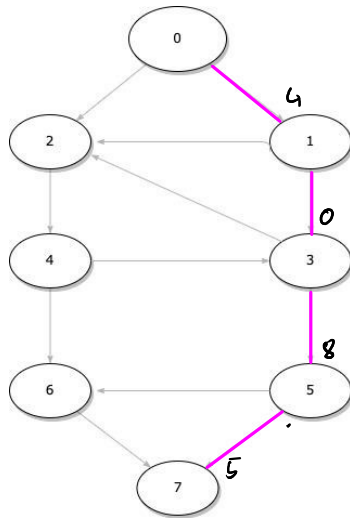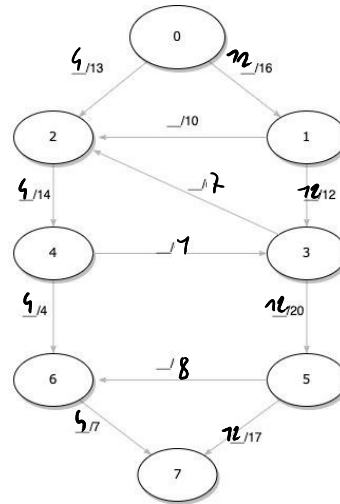**1.**   **Residual Graph (with augmenting path)**   **Current Flow**

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2.   Residual Graph (with augmenting path)   Current Flow

3.   Residual Graph (with augmenting path)   Current Flow

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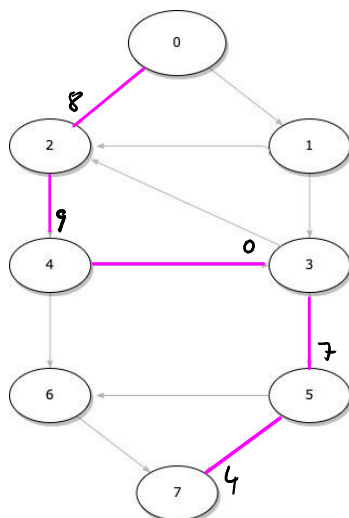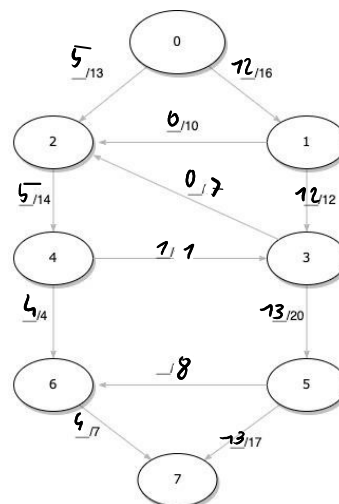
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4.   **Residual Graph (with augmenting path)**   **Current Flow**

This one is not possible because $d7 = 1$. So there is no 4 liberation.