NetPlan 2018 Homework Tasks

Preparation: (⇦ open this link to see the document)

- Instructions to access the BME Cloud environment
- List of tools, packages and tutorials
- Workflow (A sample workflow is going to be presented on the lecture of 8 November)

Task: Implement a python program (using networkx, pulp), that solves the assigned problem, and generate an image (graphviz) showing the input network and the solution.

What to submit:

- The python program
- The generated image

You have to solve one of the listed problems below, to see which one, open the following link: Assignment of Problems

Problems:

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1. Minimum cost ring topology planning

Input: 5 node network
Costs (a.k.a distances) between nodes: (node_id_i - node_id_j : cost)

1-2: 17	2-4: 19
1-3: 6	2-5: 5
1-4: 11	3-4: 8
1-5: 9	3-5: 12
2-3: 13	4-5: 10

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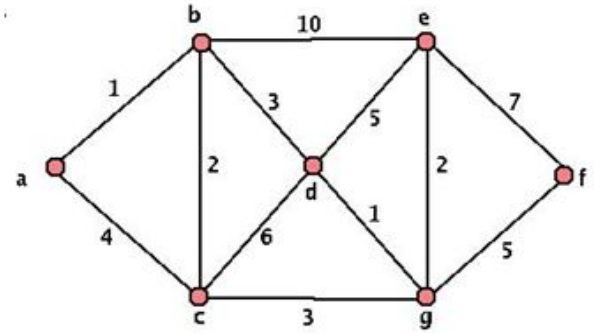
2. Virtual Network Topology: Star (Hub and spoke) - find the minimum cost topology by iterating over all possible hub nodes!
3. Virtual Network Topology: Steiner Tree with the presented Heuristic 2

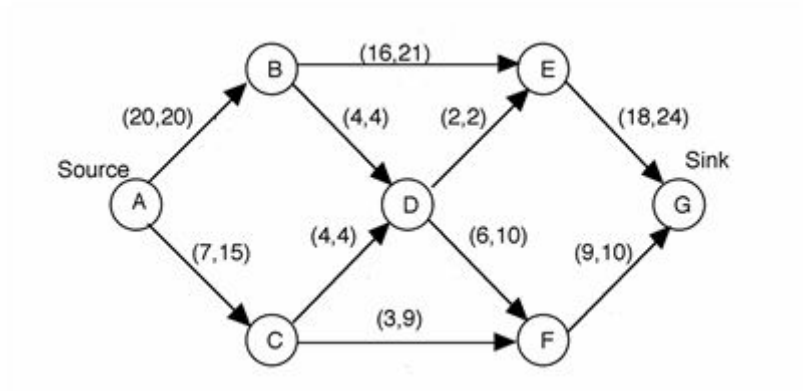
Input for 2-3:
Network topology and link costs:



VPN end nodes: b, c, e, g

4. Minimum cost flow with bifurcated flow
5. Minimum cost flow with non-bifurcated flow

Input for 4-5:
Topology: next to links: (cost, capacity)



Flow Source and Sink nodes denoted on the topology, flow value: 10

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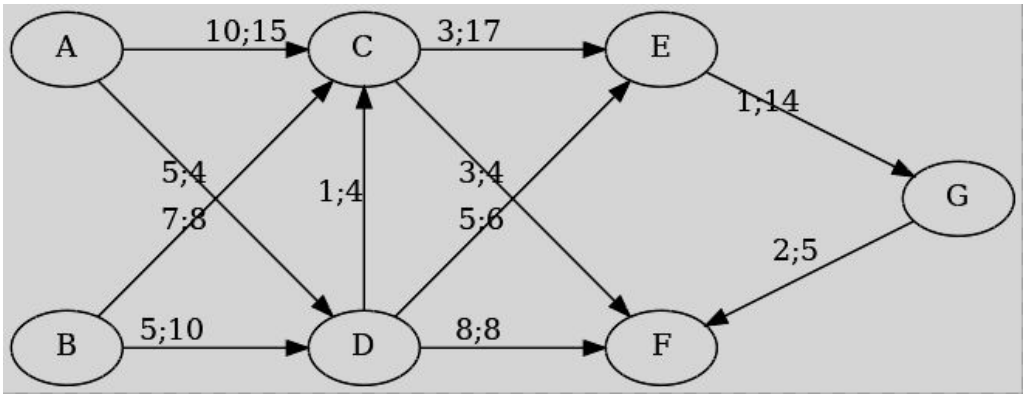
6. Multicommodity Flow Problem with bifurcated flows
7. Multicommodity Flow Problem with non-bifurcated flows

Input for 6-7:
Topology: next to links: cost;capacity



Flow 1: from A to F, required capacity: 5
Flow 2: from B to E, required capacity: 4
