

CSC 535

Advanced Computer Networking

University of Michigan-Flint



Fall 2022

November 8, 2022



Homework 5

(100 points)

due by Dec 7, Mon 11:30am

Remarks:

- Zip all the required files for your homework into one file with the following format: **LastName-Firstname-535-hw5.zip**. For example, for me it would be **Uludag-Suleyman-535-hw5.zip**. 10% penalty for not following the zip file name convention. 10% penalty for uploading multiple files.
 - No emailed homeworks will be accepted.
 - Only submission is via the Canvas system.
 - No late submissions will be accepted. There is no room for extension. The semester ends on the due date.
 - No submission means automatic 0.
 - Individual submission, not a group work! You cannot share your answers with anyone in the class. Both sharing and receiving will get zero and be reported to the university administration to seek the full invocation of the academic integrity violation rules.
 - Failure to comply with formatting rules will reduce your points.
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Questions for the deliverable:

1. Write a program that will compute the shortest-path tree rooted at nodes as noted in the networks (Figure 1, 2, and 3) provided below by using the Dijkstra algorithm, as explained in the class and in the book. You can use any programming language and any OS.
2. Write a program that will compute the shortest-path tree rooted at node as noted in diagrams by using the Bellman-Ford algorithm, as explained in the class and in the book. You can use any programming language and any OS.

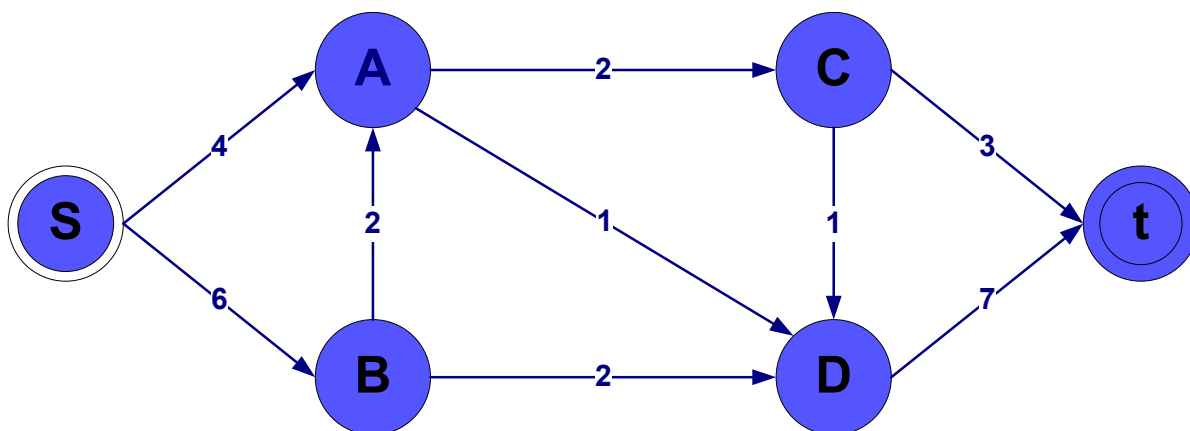


Figure 1: Network example 1: The source node is S.

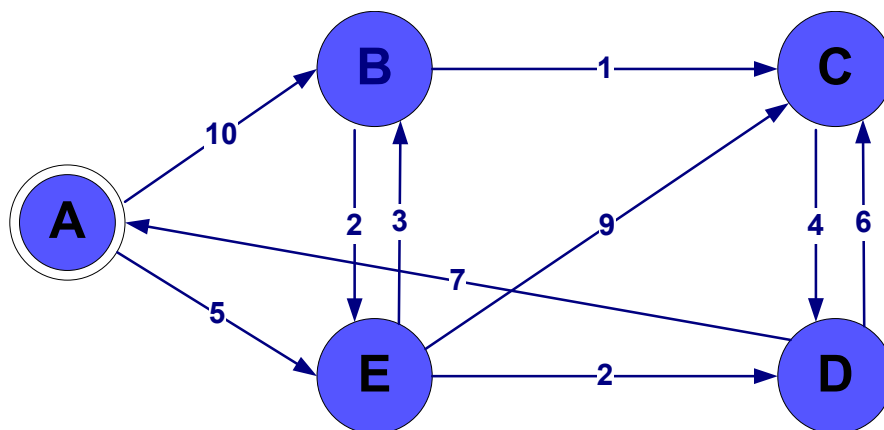


Figure 2: Network example 1: The source node is A.

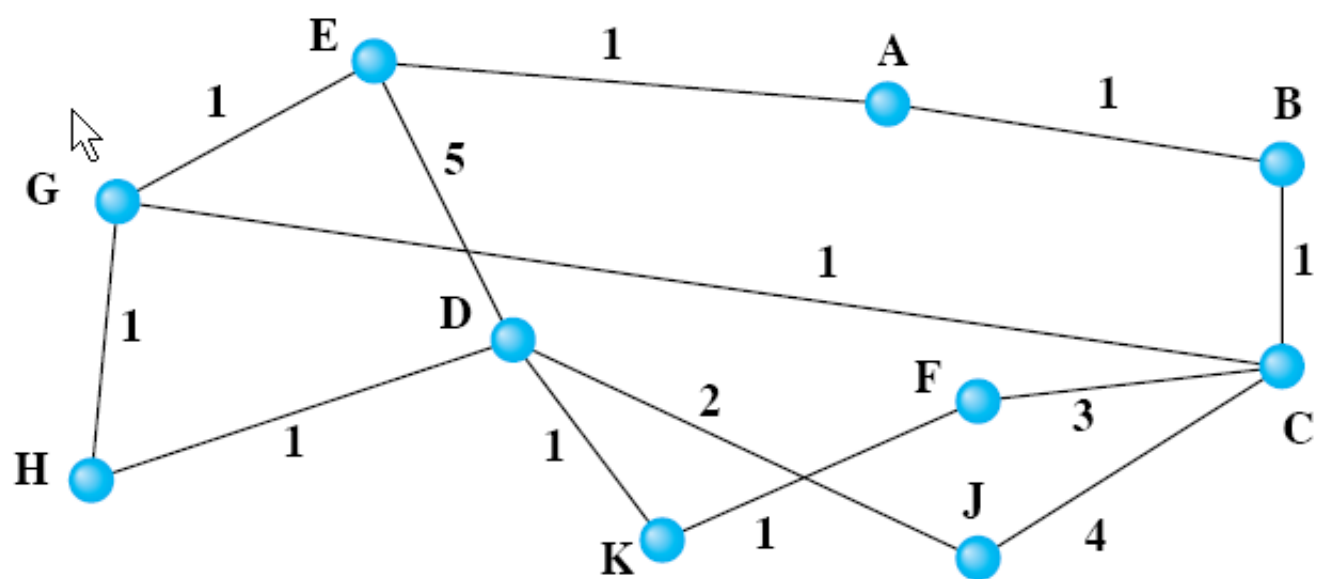


Figure 3: Network example 1: The source node is A.

Deliverables:

1. Source Code: Please indicate the compiler (IDE) and the OS with versions.
2. Executables
3. Screenshot of your answers for all three networks. For screenshot, you can use the following free program on windows:

<http://www.wisdom-soft.com/downloads/setupscreenhunterfree.exe>

For Linux/Unix, there are many alternatives. I personally like shutter.

File naming convention example:

hw5-q1a.png (or .jpg or another graphics format)

4. Please follow this file naming convention: (assuming c++ under windows). Q1 is Dijkstra q2 is BF, and three networks denoted as a, b and c.

hw5-q1a.cpp, hw5-q1a.exe, hw5-q1a.gif

hw5-q1b.cpp, hw5-q1b.exe, hw5-q1b.gif

hw5-q1c.cpp, hw5-q1c.exe, hw5-q1c.gif

hw5-q2a.cpp, hw5-q2a.exe, hw5-q2a.gif

hw5-q2b.cpp, hw5-q2b.exe, hw5-q2b.gif

hw5-q2c.cpp, hw5-q2c.exe, hw5-q2c.gif

5. You must zip all your files (total of 18) into ONE .zip file and submit your assignment by the deadline on the Canvas system. Name your file as Lastname-Firstname-hw#.zip. For example, **Uludag-Suleyman-hw5.zip**

For generating .zip file, you may use the following free software on Windows:

<http://www.7-zip.org/download.html>

Linux/Unix has many built-in.
