Homework #3: Spanning Tree Algorithm

Due date: May 17, 2021

In this homework, you are asked to write a MATLAB program to find the adjacency matrix of the spanning tree via the spanning tree algorithm in the lecture notes. Please download the adjacency matrix of network A (network_A.mat that contains a 100x100 matrix named "A") on eLearn.

1. The matrix A is the adjacency matrix of a network with 100 nodes.
   - A(i,j)=1, if there is an edge between nodes i and j and 0 otherwise.
2. Node "1" is root.
3. Please use matrix A to find the adjacency matrix t of the spanning tree via the spanning tree algorithm in the lecture notes.
   - matrix t is the adjacency matrix of the spanning tree and t(i,j)=1 if there is an edge between nodes i and j in the tree and 0 otherwise.

Upload two files to eLearn.(Please code by matlab.)

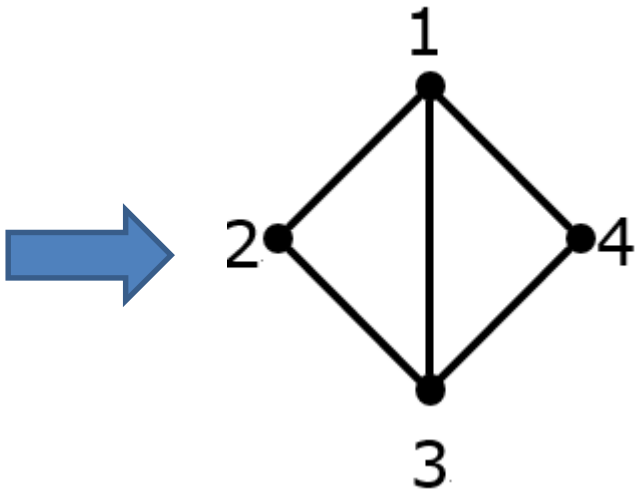
1. source code file named "code.m"
2. result data file named "result.mat" that contains the following
   - spanning tree matrix named "tree".

Other requirement:

- You should use “load” to get inputdata.
- Programs should have comments.

Example:

$$A=\begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \end{array}\begin{array}{c} \begin{array}{cccc} 1 & 2 & 3 & 4 \end{array} \\ \begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix} \end{array}$$



$$t=\begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \end{array}\begin{array}{c} \begin{array}{cccc} 1 & 2 & 3 & 4 \end{array} \\ \begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix} \end{array}$$