Homework #3: Spanning Tree Algorithm

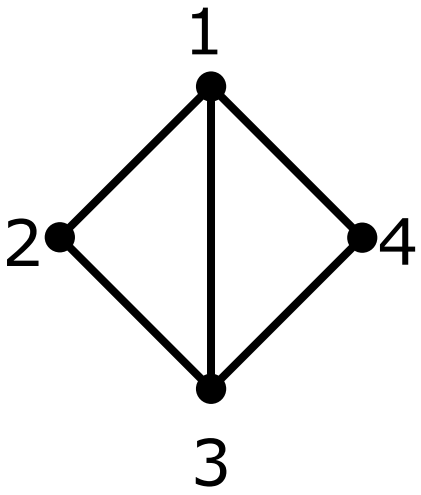
Due date: April 15, 2018

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 iLMS.

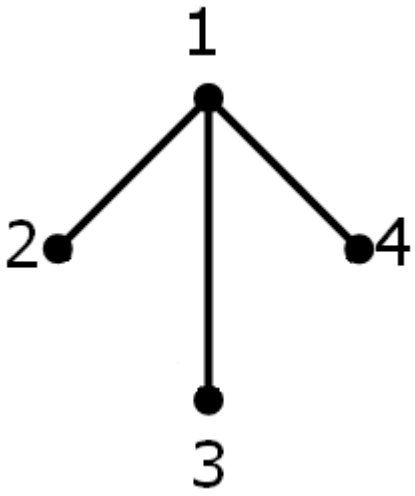
1. The matrix A is the adjacency matrix of a network with 100 nodes.
   - A(i,j)=1, if there is an edge between nodes i and j and 0 otherwise.
2. Node "1" is root.
3. Please use matrix A to find the adjacency matrix tree (t) of the spanning tree via the spanning tree algorithm in the lecture notes.
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

Examples:

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



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



Note

Upload two files to iLMS.(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 (network_A.mat).
- Programs should have comments.