

# Assignment 3

“Course 1-02-435: Distributed Algorithms in Network Communication”

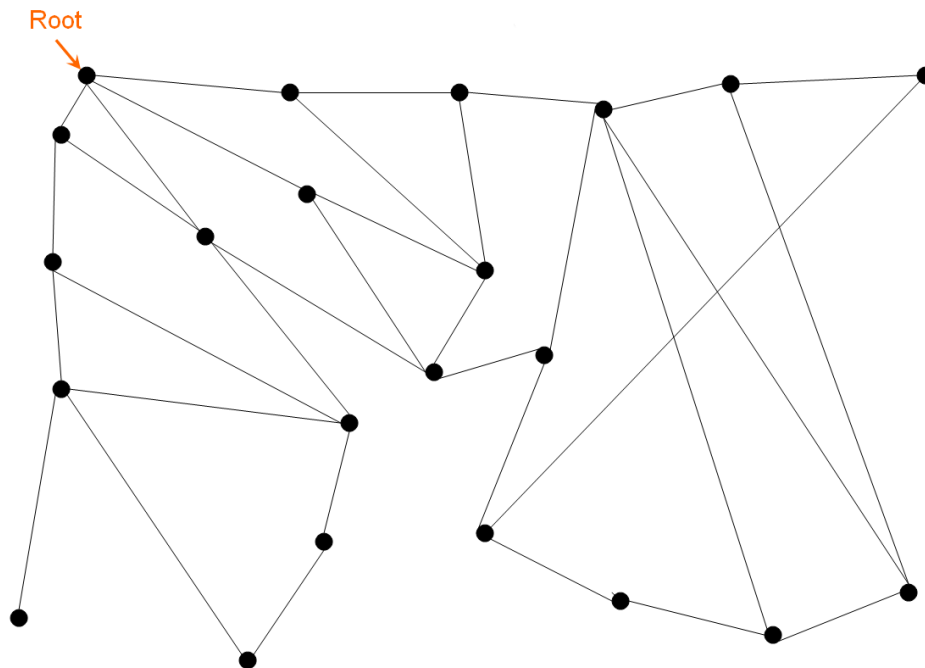
Due May 30, 2010

## 1 Tree Diameter (15 points)

Design a distributed algorithm for a tree network that terminates properly, and such that upon termination each process knows the diameter of the network.

## 2 Network Traversal (20 points / 5 points each)

Consider the following graph:



Show the steps to create a spanning tree based on the graph starting from the indicated root using the following algorithms:

- Echo Algorithm
- Tarry's Algorithm where the result **is not a depth-first search spanning tree**
- Classical Depth First Search Algorithm

(d) Awerbuch's Depth First Search Algorithm (with a final spanning tree which is different than the result you arrived at using the Classical Depth First Search Algorithm)

Show the steps followed using the algorithms in a manner similar to what was shown in class:

**Echo Algorithm** Show outgoing messages in **red** and messages from child to father in **green**

**Tarry's Algorithm** Show messages from father to child in **red**, messages from child to father in **green**, and frond (non-tree) messages in **yellow**.

**Classical Depth First Search** Show messages from father to child in **red**, messages from child to father in **green**, and frond (non-tree bounced) messages in **yellow**.

**Awerbuch's Algorithm** Show messages from father to child in **red**, messages from child to father in **green**, and vis/ack messages in **yellow**.

## What to turn in by May 30, 2010 at 11:59pm

Turn in the above work:

- via Telem
- by hand
- via email to [ise435@gmail](mailto:ise435@gmail.com)

Draw your graphs and spanning trees using any graphical tool of your choice. You may also submit hand drawings if they are sufficiently clear and understandable without outside help. I will accept submissions in the following formats:

- MS Powerpoint
- MS Word
- PDF
- HTML

I will not accept collections of image files which are not viewable in a single file and with unambiguous order and labeling.

A copy of the original file used to create the above image is available on the course web page.

You may work in groups of two. I will approve one group of three since there are an odd number of students.