Distributed Algorithms Hw 2

Question 1 (30 pts): Please implement all-to-all synchronous flooding algorithm (the algorithm that we have have covered in class). In this algorithm, each node has data ready to send at the beginning. After diameter rounds has passed, each node should have all data. You can use the same graph in example simulator code.

Question 2 (45 pts). Please implement synchronous Bellman Ford algorithm. You may use same graph in example simulator. Please run the algorithm for all source nodes.

Question 3 (25 pts). In this question you will measure the message count and runtime performance of synchronous Bellman Ford algorithm against varying node counts. Please generate random graphs with 20 nodes, 40 nodes, 60 nodes and 80 nodes. Measure total message count (total messages sent) and runtime performance for each setup. Plot 2 graphs and provide necessary comments.

Please provide a report related to homework. In your report, please explain your solution with necessary screenshots of your programs.

Bonus 1 (5 pts): Please measure performance of Bellman Ford algorithm against varying connectivity status of your graph (sparsely connected, densely connected, and a middle situation between them) You may define sparsity and density as you wish. For example a graph in which each node has 3 neighbors at the average can be defined as sparse. Similarly when there are 10 neighbors for each node at the average, graph can be defined as dense. You can implement a random graph generator in order to achieve this.

Bonus 2 (20 pts): Please implement your solution in ns2. Use IEEE 802.11 based network.

Deadline: 1.November.2012 (Ns2 submissions can be made on 8 November 2012)

Submission: Please send your homework to these e-mails:

murat.kurt@ege.edu.tr
muratkurtube@gmail.com
orhan.dagdeviren@ege.edu.tr
orhandagdeviren@gmail.com

Assit. Prof. Dr. Orhan Dagdeviren
International Computing Institute
Ege University