

## **Distributed Algorithms Programming Hw 2**

Question 1 (45 pts): Please implement Synchronous BFS Algorithm (SYNC BFS) on our Synchronous Thread Simulator (the code does not need to be same with the one in our book, you can assume that nodes are time synchronized).

Question 2 (25 pts). Please implement Asynchronous BFS Algorithm (ASYNC BFS) on our Asynchronous Thread Simulator.

Question 3 (30 pts). In this question you will measure the message count, runtime performance of SYNC BFS and ASYNC BFS 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 of the resulting trees for each setup. Plot 3 graphs and provide necessary comments by comparing these two algorithms.

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

Submission: Please send your homework (report and source codes) to the e-mail addresses of the course assistant.

Assoc. Prof. Dr. Orhan Dagdeviren  
International Computer Institute  
Ege University