

BLG 433E - Computer Communication, Fall 2014

Project 2 – FLOODING

Total Worth : 15% of your grade

Handed Out : 17.11.2014 Monday

Due : 02. 12. 2014 - Tuesday- 23:00

1. RANDOM GRAPH (25 POINTS)

You need to create a random graph.

- ✓ Node degrees of all nodes are between 2 and 4.
- ✓ You need to create network with n node. **User enters the network size as input parameter.**
- ✓ You assign node degree between 2 and 4 randomly. Node degree cannot be higher than 4, and it cannot be lower than 2.
- ✓ Graph must be connected.
- ✓ After creating random graph, you must check the connectivity of your graph.
- ✓ If the random graph is not connected, you should add an edge and supply connectivity in the graph.

2. FLOODING (35 POINTS)

Your main task is implementing *flooding*.

- ✓ The packet is generated by node 0 (the node with the lowest index). The packet sends to all nodes in the network during the simulation.

The packet should contain hop counter. The hop counter of the packet should decrease at each hop. When the hop counter of any copied packets equals to zero, your simulation terminates.

Hop counter should be defined as an input parameter .

After your program compiled, it prints:

- ✓ **The total number of times that the nodes receive the same packet.**
- ✓ **The total number of generated packets during the simulation.**
Note: When a node sends its received packet to all of its neighbors, it means the node generate a packet.

The compilation command can be:

- ✓ **`g++ yourStudentID.cpp -o flooding`**

The running command can be

- ✓ **`./flooding network_size_parameter hop_count_parameter`**

REPORT (40 POINTS)

Write your compilation command in your report.

1. (15 POINTS)

How do you create random network?

How do you implement flooding? Explain your data structures in detail.

How does your implementation work? Explain in detail.

2. (10 POINTS) Run your simulations

- ✓ Setting hop count as 5
- ✓ Setting network size as 10, 20, 30, 40

Draw the graph for the relation between the network size and number of generated packets during the simulation.

3. (10 POINTS) Run your simulation by

- ✓ Setting hop count as 5, 10, 15, 20
- ✓ Setting network size as 30

Draw the graph for the relation between the hop count and number of generated packets during the simulation.

4. (5 POINTS)

Explain the results you obtained in (2) and (3). How do the hop count and network size affect the number of generated packets?

Policy: You may discuss the problem addressed by the project at an abstract level with your classmates, but you should not share or copy code from your classmates or from the Internet. You should submit your own, individual project. Plagiarism and any other forms of cheating will have serious consequences, including failing the course.

Submission Instructions: Please submit your homework through Ninova. Please zip and upload all your files using filename HW1_ studentID.rar. In the zipped file, you must include your completed report_StudentId file and all your program and header files.

All your code must be written in C++, and we must be able to compile and run on it on ITU's Linux Server (you can access it through SSH) using g++. You should supply one yourStudentID.cpp file that calls necessary routines for all questions (Multiple files are acceptable, as long as you state the compilation instructions in your report). When you write your code, try to follow an object-oriented methodology with well-chosen variable, method, and class names and comments where necessary. Your code must compile without any errors; otherwise, you may get a grade of zero on the assignment.

If a question is not clear, please let the teaching assistant know by email (ozens@itu.edu.tr).