

Workshop on CINET – August 11, 2015

CINET/GRANITE Exercise – II(a)

**Purpose:** To familiarize attendees with the random graph generation facility of CINET.

**Overview of the Exercise:** Generate three random graphs each with 1000 nodes using the Erdős-Renyi (ER) model using edge probability values of 0.01, 0.02 and 0.05 respectively. For each of the three graphs, compute the following measures using CINET.

- (a) The size of giant component (i.e., a largest connected component).
- (b) The number of triangles.
- (c) The number of bridge edges.

Please present your answers in the table shown below.

Prob.	#Nodes	#Edges	Giant comp. size	#Triangles	#Bridges
0.01	1000				
0.02	1000				
0.05	1000				

**Additional Notes:**

1. Under the “Network Generators” tab, CINET has a “ $G(n, p)$  random graph” choice that generates an ER model random undirected graph with a specified number of nodes ( $n$ ) and edge probability ( $p$ ). Please use that graph generator for this exercise.
2. After you generate a random graph, you need to add it to the CINET repository of graphs so that you can use CINET to compute all the required measures. To add the generated network, please use the following steps.
  - (a) Click on its “View Report” link to see the output files generated.
  - (b) Download and unzip the output.
  - (c) Rename the `output.out` file as `output.nx`. (The extension “.nx” indicates a file that can be processed by CINET using NetworkX.)

(over)

(d) Use the “+New Network” tab (in the “Networks” tab of Granite) to upload the generated network and do the following:

- Select the option “Directly upload a file”.
- Click on “Done”.
- Choose the file (`output.nx`) to upload.
- Provide the requested details for the network (e.g. name, type) and select visible “Only to me” option. (This will make the network private to you.)
- Click on “Save”.
- The uploaded network will be seen in the “Networks” list.

3. Now, use the “Network Analysis” button to compute each necessary measure for the added network.