Student Name: _____          J#: _____

## CSC 641 Network Science
## Fall 2016
## Instructor: Dr. Natarajan Meghanathan
## Quiz 3 (Take Home)

**Due: November 10, 2016** (6 PM, in class). Submit a printed hardcopy in class (with this quiz sheet as a cover page and your name and J# on the top of the sheet).
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1) (65 pts) Given a graph below, run the complete linkage clustering algorithm to determine a modular partitioning of the graph into communities.
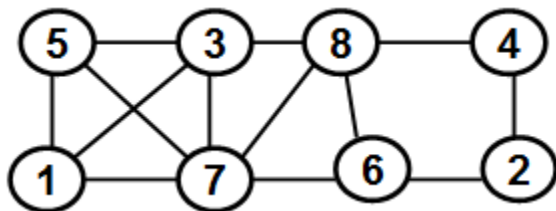(a) Show the entire hierarchy
(b) Run the pairwise modularity program to compute the modularity of each of your clusters and prune the branches of the hierarchy and determine the modularity score of the final partition.
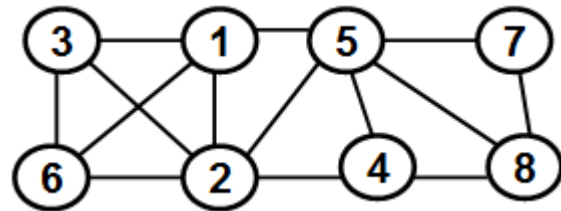(c) Determine the internal and external densities of each of the communities of the final partition.
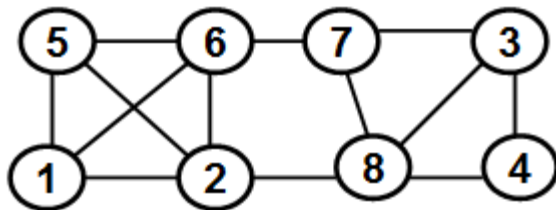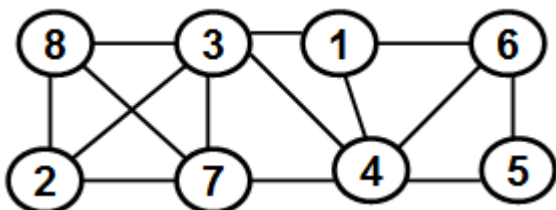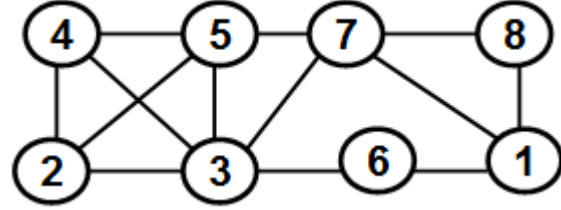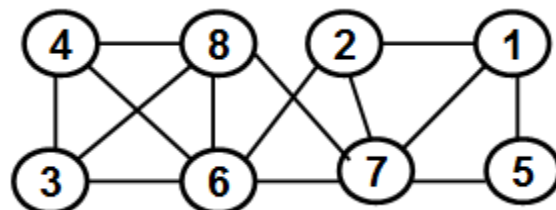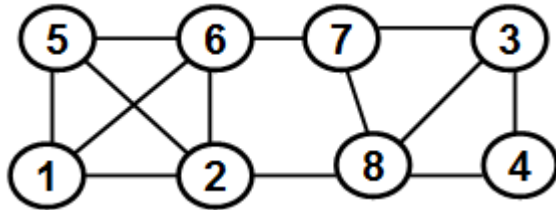
Chen Fang
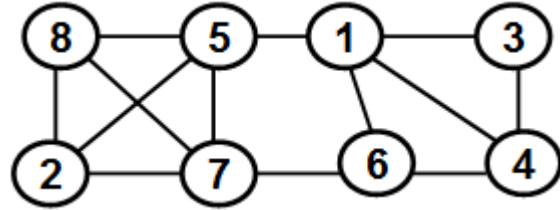
Alnazer Elbedairy
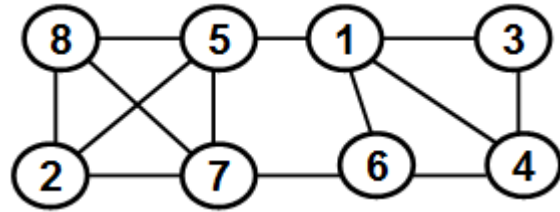
Di Wu

Carlos Martinez

Osho Oyeyemi

Li-Jing Chang

Fei Yang

2) (35 pts) Given a graph, compute the betweenness centrality of a target vertex (tv, as indicated) with respect to the pair (u, v), as indicated for each student. Show all the work.


Chen Fang


Alnazer Elbedairy


Di Wu


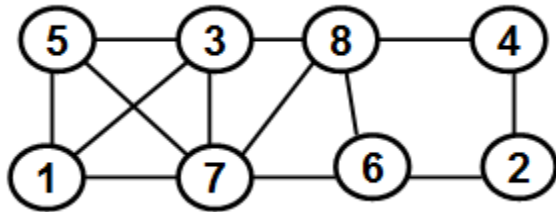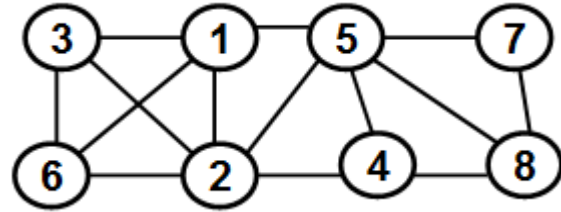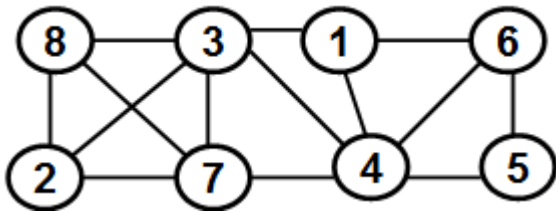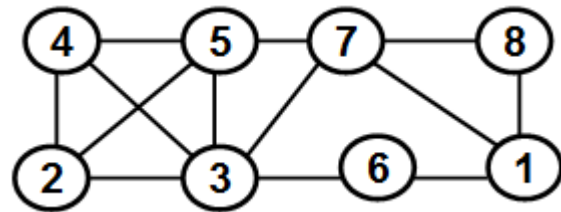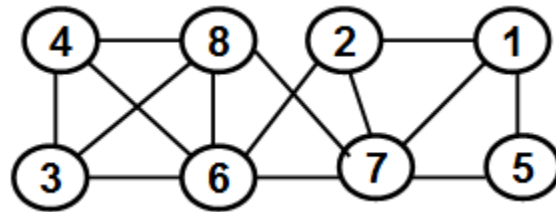Carlos Martinez


Osho Oyeyemi


Li-Jing Chang


Fei Yang

| Student Name | Target Vertex, tv | (u, v) Pair |
|---|---|---|
| Chen Fang | 7 | 4, 5 |
| Alnazer Elbedairy | 2 | 4, 8 |
| Di Wu | 8 | 2, 5 |
| Carlos Martinez | 6 | 3, 8 |
| Osho Oyeyemi | 4 | 5, 8 |
| Li-Jing Chang | 3 | 1, 4 |
| Fei Yang | 3 | 4, 5 |