HW #5

1. Given the following adjacency matrix

$$\begin{bmatrix} 0 & 1 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \\ 1 & 1 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 & 1 & 0 \end{bmatrix}$$

   a. Provide the maximal 2-cliques for this graph.
   b. Provide the maximal 2-plexes for this graph.
   c. Are there any structually equivalent nodes in this graph? If yes, list them.

2. Using the graph from problem 1,
   a. Find a minimum cut that creates partitions P_1 and P_2 where $|P_1|=4$ and $|P_2|=2$.
   b. Find a minimum cut that creates partitions P_1 and P_2 where $|P_1| = |P_2|= 3$.
   c. For each of the cuts in a and b above, calculate
      i. Ratio Cut (P)
      ii. Normalized Cut (P)
   d. Which cut is preferable based on the above metrics?

3. Social Media Mining (SMM) Ch 6, problem 7
4. SMM Ch 6, problem 9
5. SMM Ch 6, problem 10
6. SMM Ch 6, problem 11
7. SMM Ch 6, problem 12
8. SMM Ch 6, problem 13
9. SMM Ch 7, problem 2
10. SMM Ch 7, problem 3
11. SMM Ch 7, problem 4
12. SMM Ch 7, problem 7