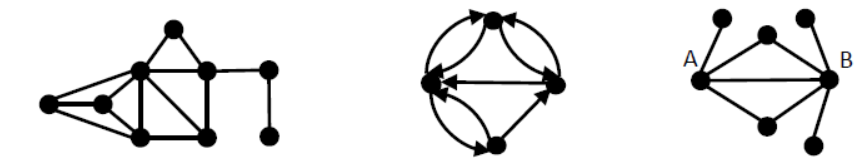
**CN Quiz 4**

Name: Erwin Wu

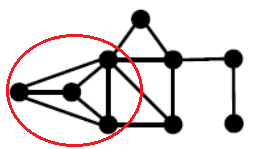
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**Consider these three networks:**



**a. Find a 3‐core in the first network.**

There is a 3-core showing below, each node of the subset is connected to at least 3 others:



**b. What is the reciprocity of the second network?**

There are 8 directed edges in the graph. So, m = 8 while

There are 3 pairs of loop of length two in the network, which means

So, we have

**c. What is the cosine similarity of vertices A and B in the third network?**

Since this is an unweighted simple graph, we can change the expression to:

of which is the number of common neighbors of A, B. And stand respectively for the degree of A and B. In conclusion, the cosine similarity is