**Procedure for pseudo code**

1. This study suggests closed similarity idea to use local sub-networks to detect com-

munities in Heterogeneous networks. This approach develops a node partition by using distance measurement to rely on closed similarity between nodes.

**2. Local Network**

A local network is a subset of network whose vertices are adjacent. It is interested that how similar are these different vertices? In this research, a method which is based on the nodes local networks is proposed to quantify the nodes similarity in heterogeneous networks. Each nodes local network is constructed by the directly connected nodes in the network. The objective is to maximize the probability of neighborhood of a node v, denoted as N(v), i.e  conditionally represented f(v).  Denotes type t neighbors of v and T is the number of node types. Here we call number of neighbors is the degree of node. The probability of each node in the local network will be defined by probability of any node c under f(v) as

Pr(c)|f(v)= 

3. Then we take the Dataset of heterogeneous network

4. We apply the concept of closed similarity among nodes as follows

Intuition 1: The similarity between x and y is related to their closeness.

Intuition 2: The more differences between x and y, the less similar they are.

Intuition 3: When x and y are identical their similarity is maximum, no matter how much closeness they share.

5. Hellinger distance on probability distribution 



6. Procedure for defining each node’s probabilities

First, calculate each node’s degree. Find the network’s maximum degree.

Second, set the scales of each node base’s probabilities to the maximum degree value.

Third, use the degree of neighboring nodes as probability components.

Finally, sort the odds from the high to the low.

OR

Find local networks and generate sets of probabilities.

Calculating relative distance between each node pair.

Calculating similarity of each pair of nodes based on relative distance.

At the end

7. We Find information on the structure of each node.

8. Comparing each node’s information to quantify node similarity.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

NOTE: Fawad sb in the resulting communities we have to discuss the structural similarity among nodes. For this please see the paper titled “node role and community structure in network”

For comparison work please focus on the following points:

1. OUR comparison should be of heterogeneous network for example DBLP, or movie dataset

But nodes should be of 2 type’s means bipartite.

2. Comparison should describe our result should slightly better or even equal to exiting result is also ok but not low

2. You can use comparison of our method heterogeneous network node similarity under distance measure with any other heterogonous network community detection method.

3. All results should clearly presented with tables, plots, line plots with clear labels and titles etc.

Show that when the hellinger distance between 2 nodes will minimum its close similarity will maximum .