1. **Dataset chosen**: email-Eu-core network
   Nodes: 1005
   Edges: 25571

   Tool Used for Part A - Gephi
   Library Used for Part B - iGraph Python Library

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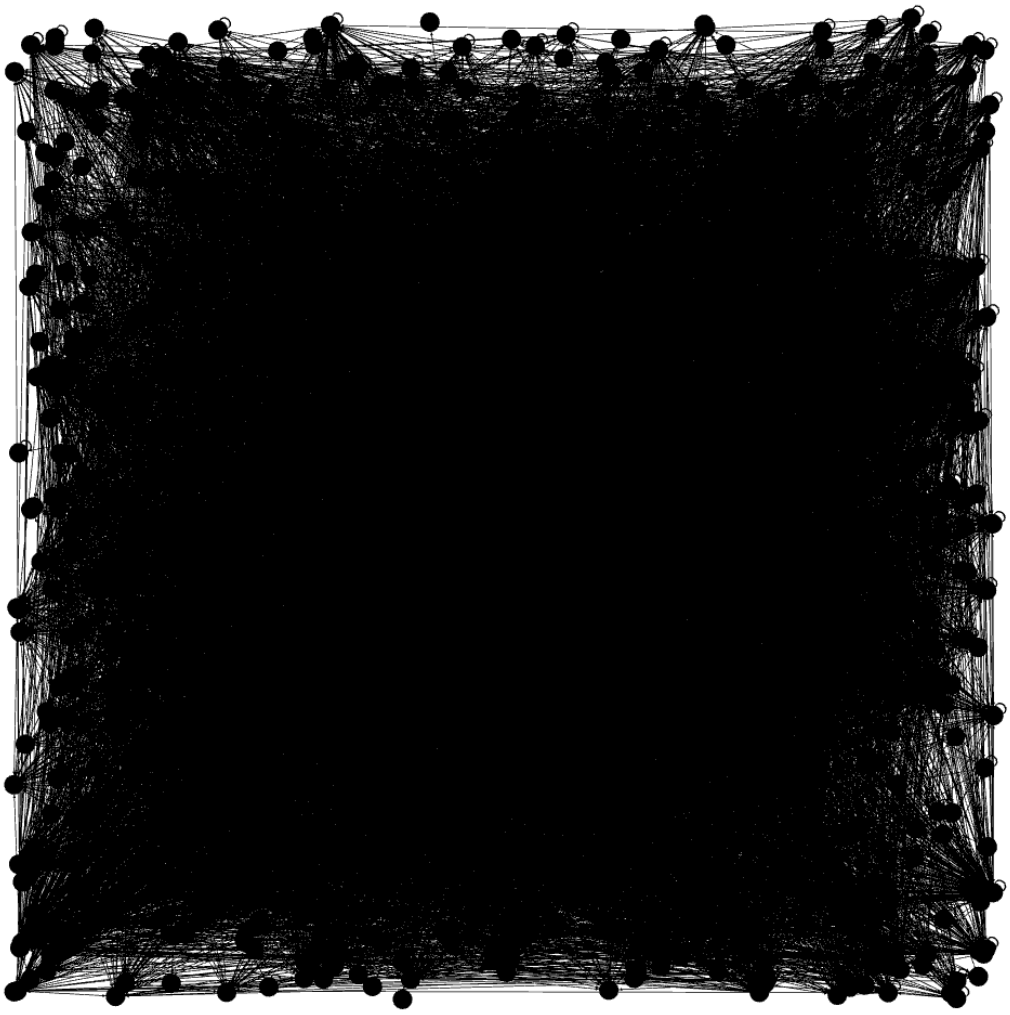
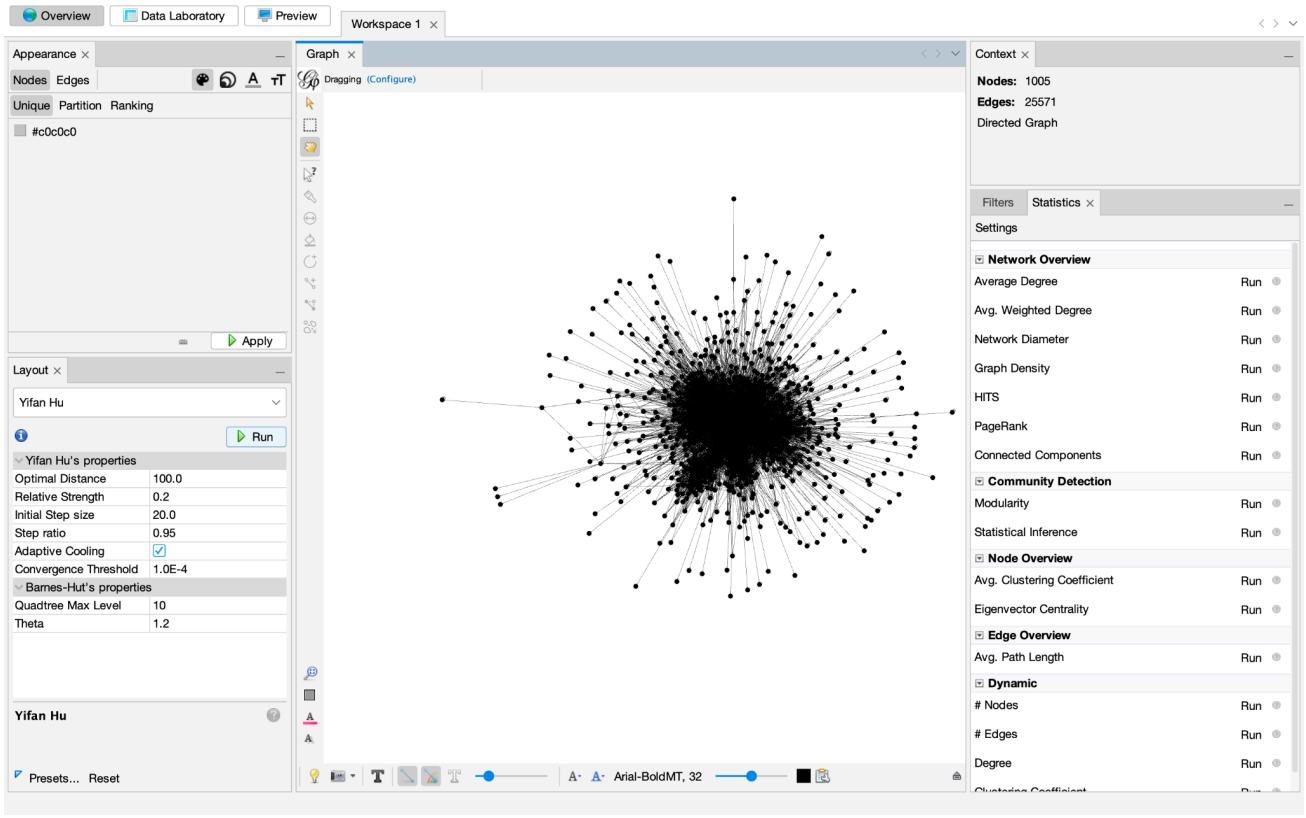
View of Dataset just after loading it

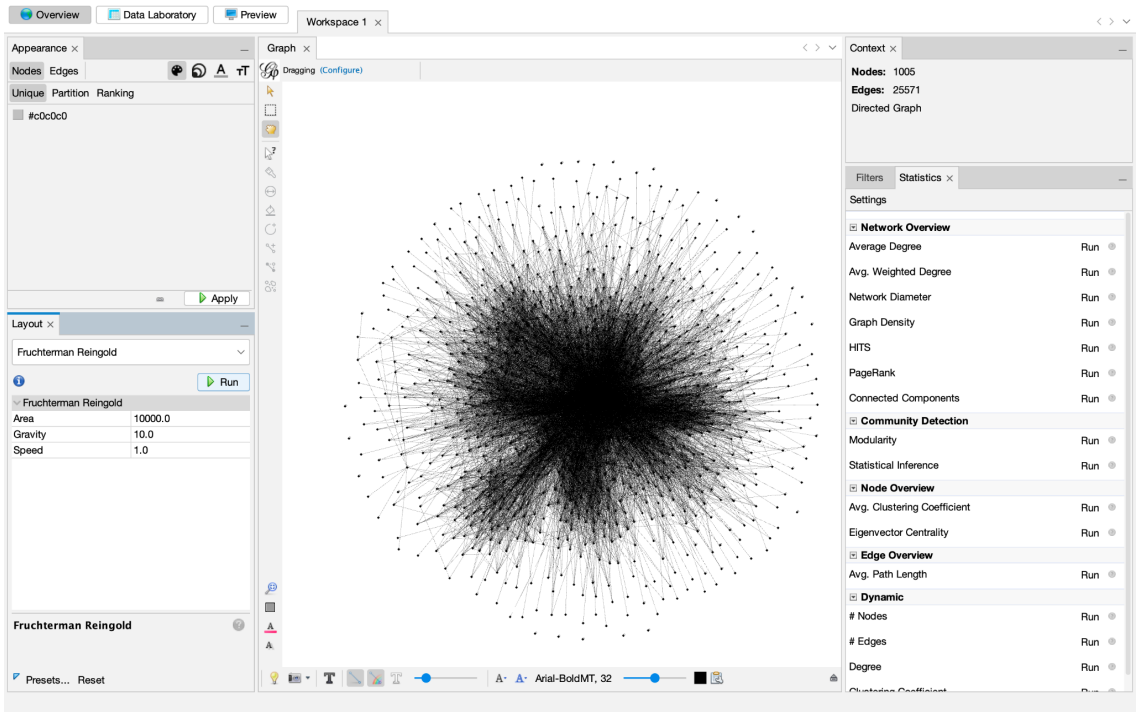


2. Visualize the graph using 2 layouts.

View after applying Layout 1 (Yifan Yu)

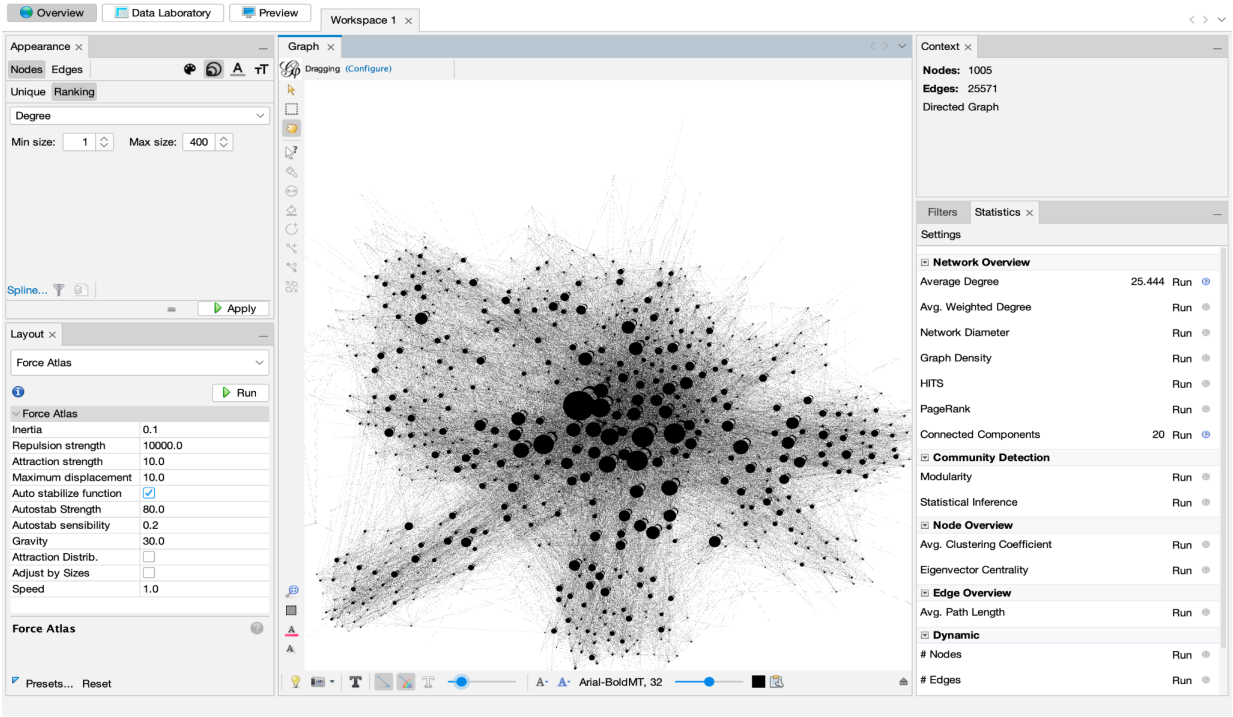


View after applying layout 2(Fruchterman Reingold)



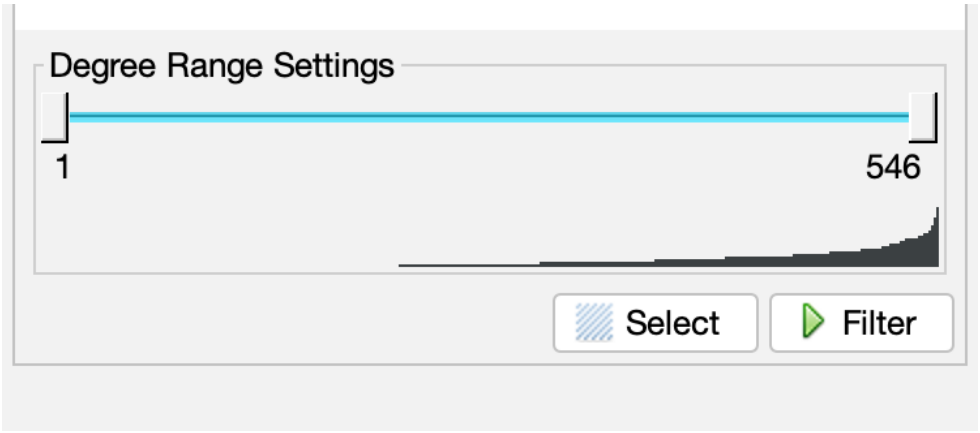
3. Calculate the Degree Distribution

   Assign sizes to the vertices based on their total degree.



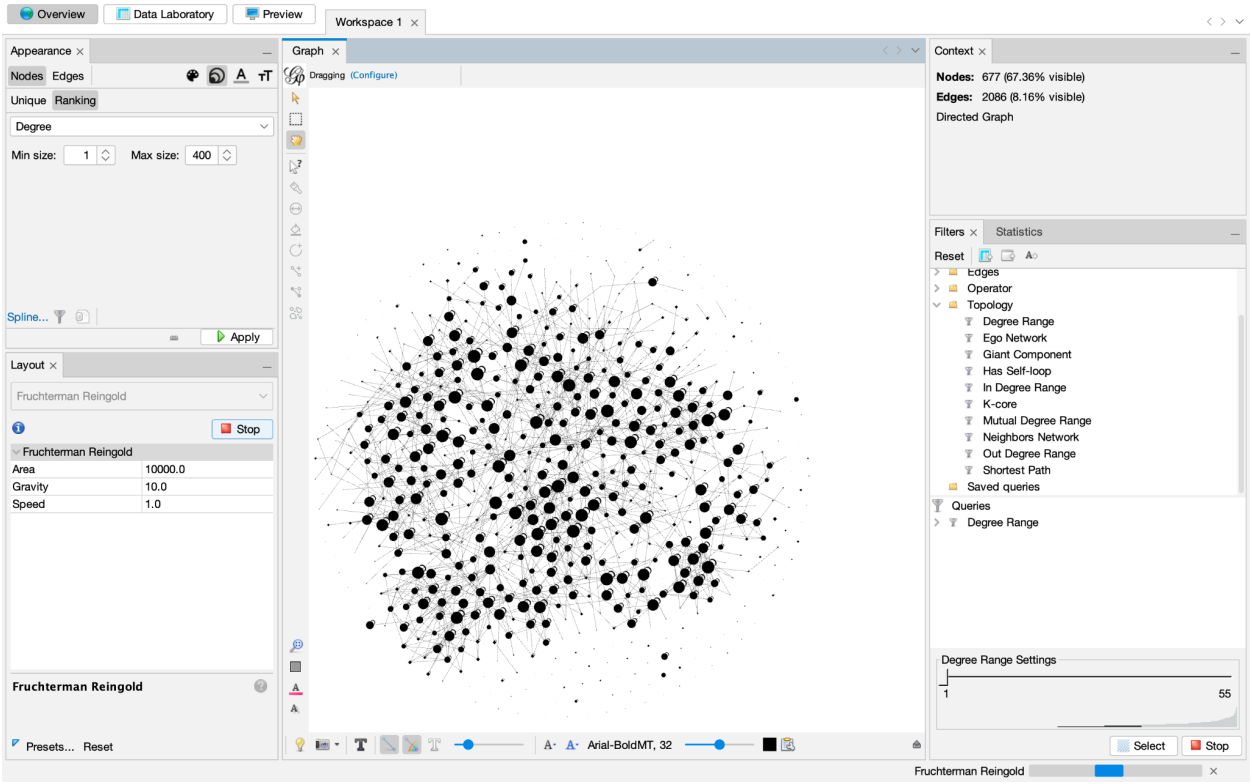
4. Filter the network by degree such that

Degree of nodes varies from 1 to 546 in the dataset. Screenshot of which is attached herewith:



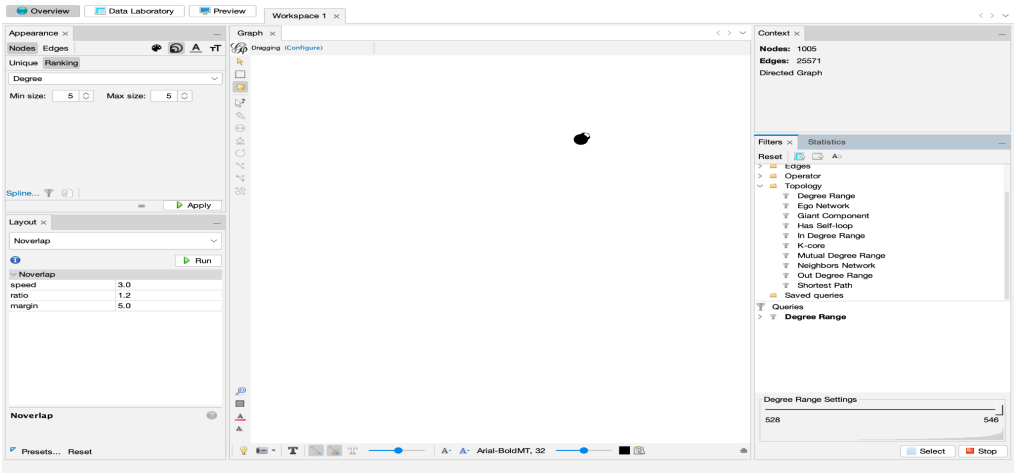
4.1 The bottom 10% of the nodes and the connection among them are visible

So, 10% of 546 = 55. We need to filter to see the connection of nodes with degrees from 1 to 55 which is shown in the screenshot below:

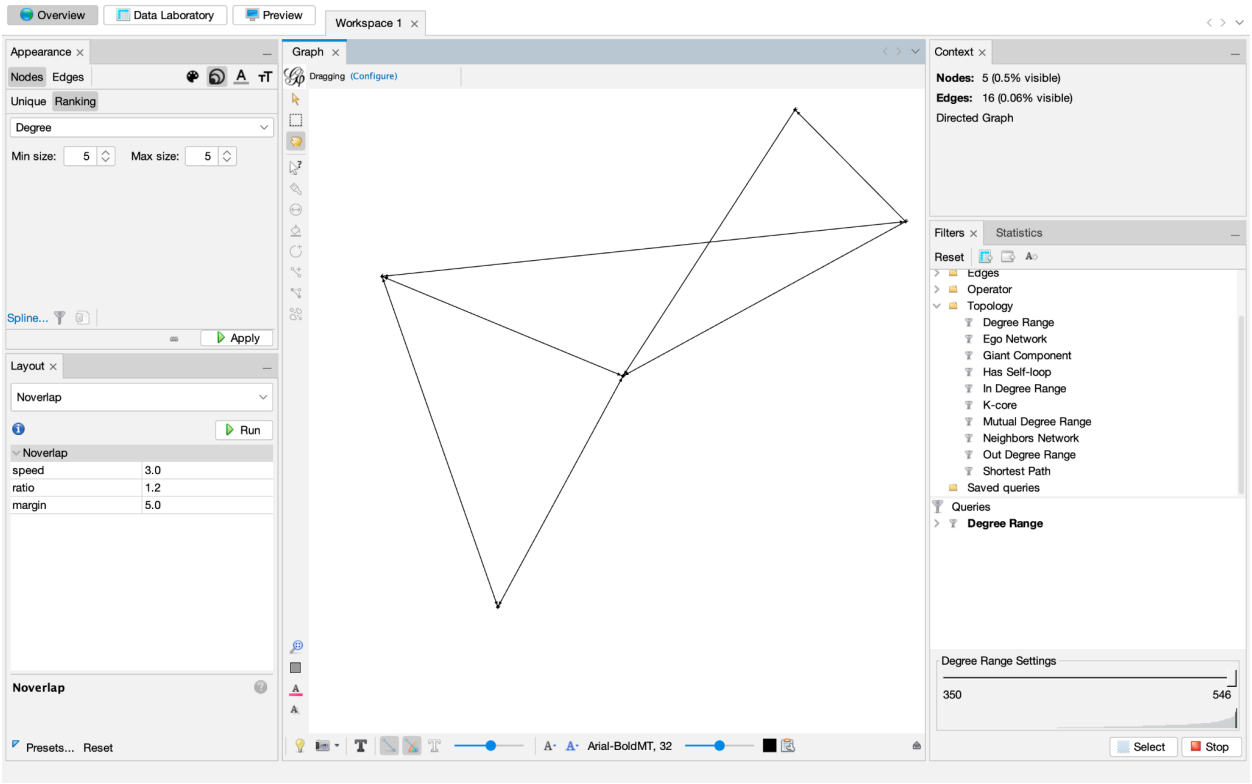


4.2 Top 5% of the nodes and their connection are visible

5% of 546 = 28. We need to filter to see the connection of nodes with degrees from 518 to 546 which is shown in the screenshot below:



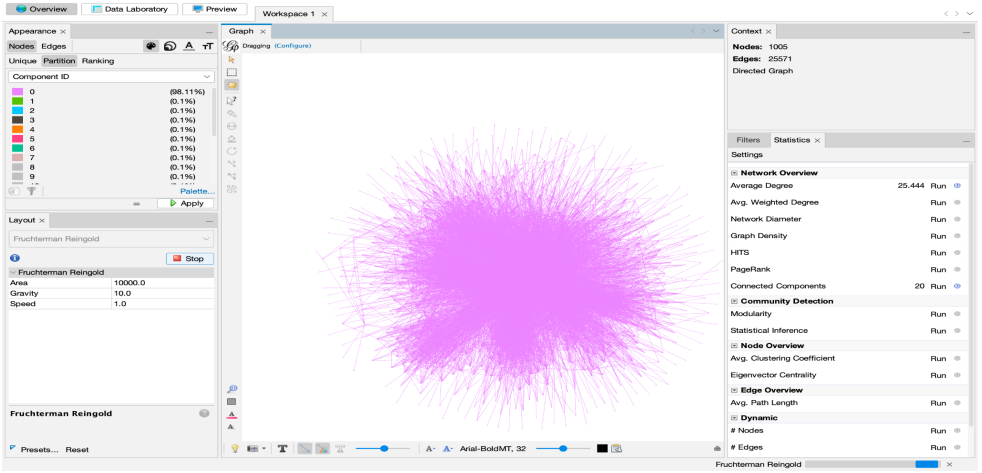
There are very few nodes that have a degree range from 528 to 546. So, taking the range from 350 to 546 produces the following screenshot:



5. Find:

5.1 All the connected components of the network.

There are 20 connected components in the graph. But one component dominates and occupies 98.11% of the whole network which is shown in pink color.



5.2 The size of the giant component of the network

The size of the Giant component in the network is 98.11% of the network comprising 986 nodes out of 1005 nodes and 25552 edges out of 25571 edges.

I have filtered the Giant component to make that make visible which is shown below: