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1.

(a) nodes represent networking routers, edges represent connections between the routers. Routers are packet forwarders and form a layer where data can be routed through many different paths along the routers.

(b) This should be read as an undirected graph because the edges represent the existence of a connection between the two routers, and information between routers can flow either way

2. plotted in the .ipynb file

3. average clustering coefficient of the network is 0.15817326006876706

4. I could not calculate the average shortest path in the network because my computer was taking too long to run it (I've run it multiple times having it compute for ~20 minutes and no result)

This network has so many nodes and the algorithm is $|V|^3$ and I've tried it with simple test-networks with 5 nodes and it outputs a value. It really just took too long to compute).

5. largest clustering coefficient of the network is 1.0

6. There are 10542 nodes with the clustering coefficient of 1.0, I stored them in a list named `max_clustering_nodes` in the .ipynb file

7. Similar to question (4), I could not find the value of the longest shortest path of the network.

8. Similar to question (4), I could not find the nodes in the longest shortest path of the network. But I provided the code in the .ipynb file that would calculate these two answers if I were to have obtained a list of all shortest paths between nodes.