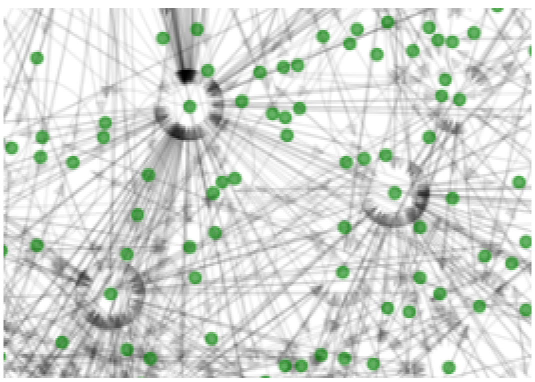
A.
Node is an airport and edge is the connection between 2 airports which says that flights travel from one end of the edge to the other end of the edge.
Number of Nodes are basically the number of airports and they are: 894 and the number of edges are number of connections of airports: 13760

B.The nodes of the graph are basically distributed in 4 different regions separated geographically. Airports at 2 places are completed far from the main section of the graph. They are located towards the right side and 2 airports in the bottom left. And most of the nodes are concentrated in the center of the graph. And the network in the center is dense as there are more edges with the airports in the center of the graph.
There are airports with self loops which graphically seem to be starting and ending at the same point but this is due to the airports which are near to each other having the same airport id. The route might be from one airport to the other in the same region which is shown as a self loop.
There are certain airports where the number of incoming edges are seem to be high



These are seeming to be important airports just analyzing the plotted network

C.
The nodes with less degree seem to be more and the nodes with high degree are very less. And hence, this is a power-law. Degrees of most of the nodes seem to be in the range 0-50 and the nodes with degrees >50 are very few.
Degree rank plot shows the plot of the degrees of the nodes in descending order. Hence we can see the nodes with highest degrees towards the upper left of the graph and most of the nodes are concentrated little above and below the curve which is around the rank 100. We can also see that there are very few airports in the graph which have the highest degree.

D.
The graph contains some set of nodes where the connectivity is very dense. These nodes are located in the center geographically and have the most number of edges. The rest of the nodes are spread out in different regions and are well connected to few of the most connected airports which shows that the airlines schedule flights to these important ones so that they can have a connecting flight to their desired destination.

E.
Average clustering coefficient of the graph is 0.5151.
The nodes with clustering coefficient 1 are around 100 which shows that these airports tend to form a cluster with the other airports and form a well connected network reducing the number of hops. As we go further in the graph, the nodes have very less clustering coefficient and these airports connect to the well connected airports which makes the routing easier.
We can also say that there are more chances of reaching any node from any randomly picked node. This also indicates that the average shortest path length is small. Hence,in the concept of small worldness, the length of the number of steps is smaller. This also indicates that our airport network is robust in case of single node failures but also there can be difficulty when an attack is specifically targeted on a hub.

F.
The top 10 most important airports based on pagerank score are
Denver International (airport id: 112-92), Dallas/Fort Worth International (airport id: 11298), Chicago O'Hare International(airport id: 13930), Ted Stevens Anchorage International (airport id: 10299), Hartsfield-Jackson Atlanta International(airport id:10397), Fairbanks International (airport id: 11630), Douglas Municipal (airport id: 11057), Phoenix Sky Harbor International (airport id: 14107), Memphis International(airport id: 13244), Minneapolis-St Paul International (airport id: 13487).
The nodes with high pagerank seem to me most important and most influential in the network. As the score depends on the nodes that are linking it, the nodes that are connected to the higher pagerank score nodes tend to be more important as well. This score helps us identify the hubs in the network and hence we know the crucial airports where most of the traffic is where most of the airlines have their connecting flights.

G.
The top 10 most important hubs and authorities:
Top 10 Biggest Hubs [(10397, 0.011091413715196823), (11292, 0.010867112430822448), (13930, 0.010807784511584909), (11298, 0.01072620103658908), (13244, 0.01052437141472659), (14100, 0.009893463383107247), (12889, 0.009866177129818148), (11057, 0.009857304537613588), (13487, 0.009770138089794309), (12892, 0.00971860875741501)]

Top 10 Biggest Authorities [(11292, 0.010985791978555693), (10397, 0.010864123359412347), (11298, 0.01076131752665295), (13930, 0.010613211902404614), (13244, 0.010582992351075361), (12889, 0.010082646481226256), (14100, 0.010008257719157802), (10693, 0.009961046586770984), (13487, 0.009821757310018168), (14107, 0.009756191224934414)]

This information says important information about the connectivity of the graph. The hubs seem to be connected to various other airports which say that we can go to any other place through these hubs. The authorities seem to be the main places for the other airports which are comparatively less connected and hence the airlines bring their passengers to one of the authority nodes and then they can easily schedule a flight from here.

H.

Degree centrality score

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<Axes: title={'center': 'Degree centrality scores'}, ylabel='Frequency'>
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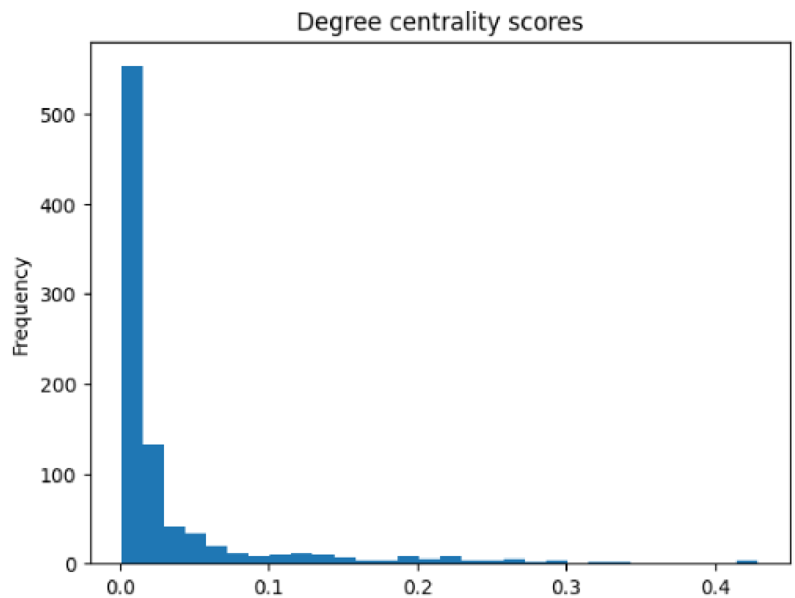
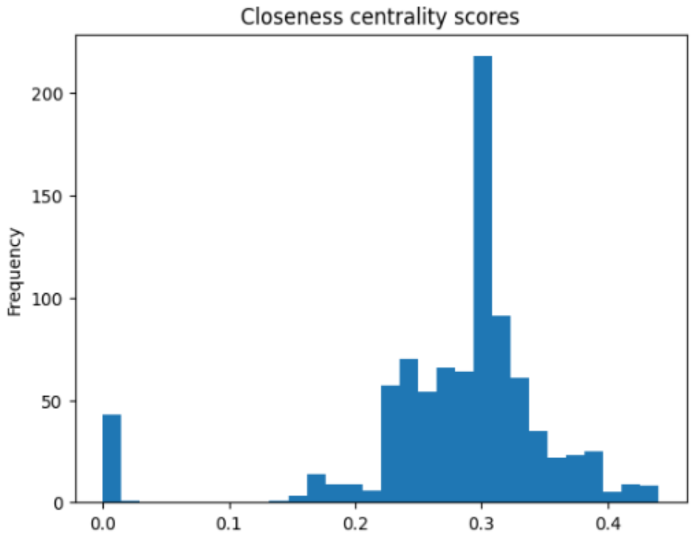


The degree centrality scores for most nodes seems to be in the range of 0.0 to 0.1 especially most nodes 0.00 to 0.04. We can see that the airports with score >0.2 are very few, which actually makes sense as the number of hubs are very less and the other airports are connected to these hubs to minimize the number of flights scheduled. But we are not able to differentiate the nodes which have only in degree or only out degree. These nodes have high score but they cannot be considered as hubs.

Closeness centrality scores

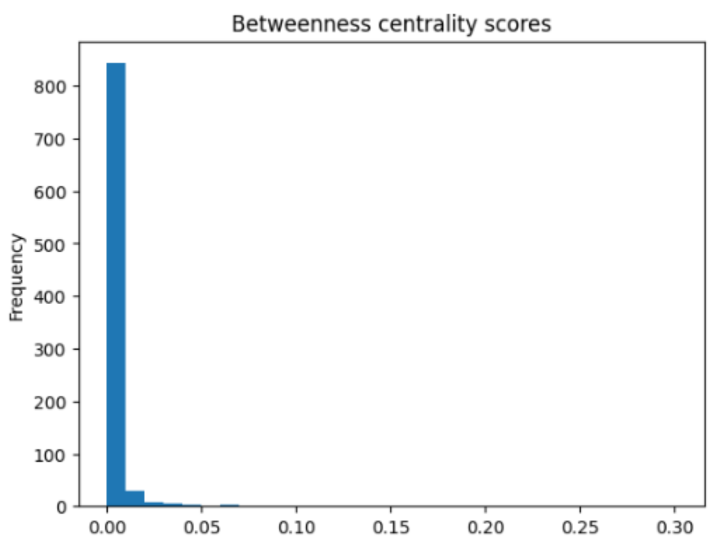
<Axes: title={'center': 'Closeness centrality scores'}, ylabel='Frequency':



There are very few nodes which have very low scores which says that there are very few airports which are not well connected to other airports and take help of hubs. Most of the nodes are concentrated in the region of 0.2 to 0.4. These are the nodes that are located in the US geographically and are well connected with the hubs and few other airports. The nodes with score of >0.4 seem to be the hubs which are well connected to almost all the other hubs and the average length of the shortest routes to other airports comes down to a small number.

Betweenness centrality scores

<Axes: title={'center': 'Betweenness centrality scores'}, ylabel='Frequency'>



This plot shows that betweenness scores of most of the nodes are in the range of 0.00 to 0.025. So there are very few nodes which form an important stop for the airlines. So, routes of many airports are independent as there are very few airports which fall in between the shortest routes. So the network is not vulnerable to certain airports but distributed across the region not having too much load on a single airport.

I.
In the strongly and weakly connected components plots, very few components have more nodes.
Strongly connected components
There are 47 connected components. One component has 830 nodes and the second highest has 16 nodes.
Most of the components have nodes just above 0 while the number of components that have more nodes are just above 0. You can travel to most of the airports from any one airport present in that strongly connected component. Most of the traffic is concentrated within this set of nodes.

Weakly connected components
These show components where nodes are just connected without the sense of direction. This is useful to identify those airports which are far away from the hubs. These help airlines to just connect those remote airports to connect to hubs and hence increase reachability.