Exercise for Lab session 4–Measures II

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9/14/2020

After attending Lecture 3 on "Measures II" and doing the "Measures II" tutorial, go ahead and do the exercise below. Do this before the lab meeting, so we can discuss your findings. There will not be time during the lab to make this assignment in breakout groups, but we will assume you have done the work beforehand.

The assignment is aimed to make you more skilled in dealing with network data and the interpretation of the measures on real-world network data.

ASSIGNMENT:

Load the `world_air` network from the `SNA4DS` package. This is a worldwide airline network of airports (denoted by their IATA code) and the flight connections between them.

Calculate the descriptive statistics of the "Measures II" tutorial on this network. How do you interpret the values?Calculate the degree for all of the nodes. Make a plot of the degree distribution.

Determine the degree for:* John F. Kennedy airport in New York? * Amsterdam Schiphol Airport* Hartsfield-Jackson AtlantaInternational Airport* Groningen Eelde airport* Rotterdam airport* Chicago O'Hare Airport* Daniel K. Inouye International Airport* London City Airport

Try plotting the data. You don't need to plot the network on an actual world map (although you can certainly do so if you want), ut aim to get a plot that shows some of the structure inherent in the network.

Now, calculate some of the centralities that you learnt about in lecture 3. Feel free to also calculate some other centralities that are included in the `igraph` and `sna` packages, but you do not need to. The ones we discussed in the lecture are enough for today's objective.

Again, compare the scores for the airports above (and some others you might be interested in) and look at the distributions.

For good measure, calculate the centralization scores as well.

How do you interpret the results? What do you learn about the structure of the network and the position of the nodes? How does this compare to what you know of these airports and of the structure of the international airline network?