ETH Zurich
Spring Semester 2019
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Introduction to Social Networks

Assignment $\mathcal{N}^{\underline{o}}$ 1

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Task 1: Data preparation — 5 points

(a) Load the dataset `Intro_to_SN_FS2019.RData` that we collected in the first lecture. The rows in the data-frame object `dat` represent the responses from each respondent. The columns are the variable names. The file `varnames.xlsx` and `Intro_to_SN_FS2019.docx` tell you more about how each variable was measured (e.g., with which wording was used).
Do not share these data with anyone outside of this course.

(b) create an adjacency matrix of the knowing nominations (`know_P1` to `know_P20`) with dimensions $80x80$.

(c) also create an adjacency matrix with the two seating variables (`seating_P1` and `seating_P2`).

Please submit the `R` code that you used to create these adjacency matrices.

Task 2: Describe and plot the `know` network — 9 points

In case you were not successful in Task 1, you can load the prepared matrices in the dataset `Intro_to_SN_FS2019_matrices.RData`.

(a) calculate basic network descriptives for the `know` network

- number of missings, network size, density, average degree, reciprocity ratio, gender composition in class, same gender ties
- plus one other measure of your choice
- briefly interpret the measures (where sensible)

(b) plot the `know` network

- the plot has to be informative and pretty
- color the nodes according to the department of the students
- the node size should be proportional to a centrality measure (of your choice).

(c) Now also include the `seating` network and plot them both in one network plot (i.e., on top of each other).

(d) How large is overlap between the two networks?

(e) In a short paragraph (max. 250 words), describe what you see in the network plot and comment on the overlap between the two networks.

Task 3: An (imaginary) deadly VIRUS! 6 points

Imagine that the person with the anonymized ID '1057' became infected with a deadly virus in today's lecture. She/he passes on the virus to people she/he touches. You only have two vaccinations to give. The vaccination does not work for people that are already infected. Who would you vaccinate to minimize the total infection rate of the class? Please argue based on data and theoretical reasoning.