Assignments $\mathcal{N}^{\underline{o}}$ 8

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Task 1: R: Saom and Harry Potter   20 points

In this task you will analyze the support network of 64 Characters of the famous Harry Potter books. The ties in the network indicate some kind of (social) support a character provided to another one (e.g. emotional, instrumental, informational). We will focus on the network evolution between book 2 and book 3.

Download the hp.zip file from the homepage.

The directory contains the networks *hpbook2.txt* and *hpbook3.txt* as adjacency matrices, a name file *hpnames.txt* and an attribute file *hpattributes.txt*. The included attributes are schoolyear (when did the student come to Hogwarts?), gender (1=male, 2=female) and house (1=Gryffindor, 2= Hufflepuff, 3=Ravenclaw, 4=Slytherin)

(1) Load the data in R. Decide if the data contain enough information for applying the SAOM.

(2) Create a Siena model with structural effects only.

    (2.1) What are the theories (and the corresponding effects) that, according to you, might be relevant to explain the network evolution?

    (2.2) Estimate the model and provide the output as table. Which effects are signicant and how would you interpret them?

(3) Compute the contribution to the objective funtion when a tie is added (assume that the tie closes 3 transitive triplets).

(4) Consider the following three statements:

    (a) "Girls offer more support than boys."

    (b) "Receiving support increases as students grow older."

    (c) "Support within houses is higher than between houses."

Include the corresponding effects in your model and estimate it. Provide your results in a table and decide if the statements are true or false and explain why.

Send your R-Script to `david.schoch@uni-konstanz.de`