Dr. Ali Tafti
IDS 564: Social Media and Network Analysis
Lab 3: Community detection, and class readings ch. 3 - 5

In this lab, you will use the Primary school data from the study by Stehle et al. (2011), entitled "High-Resolution Measurements of Face-to-Face Contact Patterns in a Primary School." The full reference is below.

Preparation

The associated Quiz 3 with this lab asks several questions drawing from the lecture material in recent weeks. Please make sure to have read EK chapters 1 – 5. This lab exercise will also use R. The sections on community detection, 4.3 and 4.4, in the KC book will also be helpful. You may also reference the chapter 4 code provided by the authors on Github. Related background information was provided in Lab 2.

Load and analyze the Primary School network

Please use the two attached CSV files, containing the list of edges and nodes. I have also provided an R source file, which you can extend to answer the quiz 3 questions.

In a Word or PDF document, please show the network graph plots showing community structure, using the Fast Greedy, Walktrap, Spinglass and Label Propagation algorithms in igraph. You will find the exact function call names for these algorithms in the igraph help files, online documentation or the KC book.

In addition, briefly (in a few sentences) discuss the benefits and drawbacks of using the Girvan-Newman method for community detection with this dataset. Hint: This algorithm is discussed in the EK textbook, and you can also try it in igraph.

References

Kolaczyk, Eric D., and Gábor Csárdi. *Statistical analysis of network data with R*. Vol. 65. Springer, 2014. (KC)

Stehle´ J, Voirin N, Barrat A, Cattuto C, Isella L, et al. (2011) High-Resolution Measurements of Face-to-Face Contact Patterns in a Primary School. PLoS ONE 6(8): e23176. doi:10.1371/journal.pone.0023176