BU.330.760 Deep Learning with Unstructured Data

Lab3. graph-tool and Stochastic Block Models

No Coding Version

Learning Goal: practice using graph-tool package to infer modular network structures
Required Skills: knowledge on stochastic block models and hierarchical stochastic block models

We will use graph-tool (https://graph-tool.skewed.de) in lab 3, which is an efficient Python module for manipulation and statistical analysis of graphs/networks. **But graph-tool was tested extensively *only* on GNU/Linux and MacOS X systems,** so you need to follow different instructions based on your operating system. This document is for Windows system users who do not have access to Google CoLab.

Download lab3+assignment3.zip from blackboard, unzip it to obtain lab3.html and assignment3.html.

1. Based on lab3.html, answer the following questions:

Q1: Compared the block model plot (in cell #4) to the original network plot in cell #2, how are they different? What's the information you can get from the block model plot?

Q2: What information can you get from the heat map in cell #5? Are there any assortative blocks? Any disassortative blocks? Is the result consistent with the block plot in cell #4?

2. Based on assignment3.html, answer the following questions:

Q3:How many levels are there in this hierarchical stochastic block model? How many blocks are there in each level?

Q4:From the heat maps of two levels (in cell #7 and cell #8), which blocks are assortative? Which are disassortative?

Submission:
Save your answers to Q1-Q4 in a text file (do not forget to label), and submit the text file on blackboard link.
Due: Feb 15th 11:30 am EST

Reference:
graph-tool 2.31 Documentation