

## Assignment 3

In this assignment you will analyze a real dataset from an online social network. In particular you will use the social graph of *Brightkite* [1] and you are required to provide a report with the following:

- 1) A plot of the degree probability distribution (30 pts)
- 2) A plot of the average local clustering coefficient as a function of the node degree (30 pts)
- 3) The following statistics (40pts):
  - a. Average node degree
  - b. Average local clustering coefficient
  - c. Theoretical clustering coefficient (that is considering a random graph with the same degree distribution)
  - d. Entropy of the node degree distribution (see Assignment 2)
  - e. Degree assortativity coefficient for the graph

You have to write your own code for calculating the above! If you use an existing software tool/library (e.g., igraph) you will lose 20% of the points. You can always use such a tool to double-check your results. You will have to provide me with a zip file that includes a report with the obtained results and your code.

**Note:** Some metrics that you are required to calculate (in particular local clustering coefficient and degree assortativity) depending on your implementation might take a long time to run; hence, start early. While I will not grade the efficiency of your implementation you will have to consider it.

[1] Available online: <http://snap.stanford.edu/data/loc-brightkite.html>