Laboratory 1

- In this lab we should try to achieve the following:
  1. Get up and running with `NetworkX` and `Python`.
  2. Download some networks from `SNAP` repository – `http://snap.stanford.edu`. Choose some directed and undirected networks from different application domains – social, technological, biological networks.
  3. Use `NetworkX` to compute
     1. The degree distribution
     2. The assortativity coefficient
     3. The clustering coefficient.

     of the chosen networks.

Laboratory 1 – Case Study

Determine the qualitative nature of the networks you are studying and write up a report. Do some of the following:

- For the directed networks, sketch the Broder et al picture of the network – number of nodes in strongest connected components and In the In and Out and other sections of the network.
- Fit a line to a log log plot of the degree distribution – compute the slope of this line to determine the parameter β of the power-law degree distribution model.
- Simulate the Price model to generate a network of n nodes for a particular power-law parameter α[1]. Compute all of the above parameters for the Price model. Which networks does the Price model best represent?

[1] Note that $\alpha = \beta - 1$