Analysis and Modeling of Social and Information Networks
CIS 4524/5524, Spring 2021

Assignment 3, due February 11 by 5pm on Canvas

Problem 1.
In an Erdős–Rényi graph with N=4000 nodes, the linking probability is p=0.001
a) What is the average degree of a node in this graph?
b) What is the variance in the degrees of the nodes?
c) What is the expected number of nodes with a degree which is at least twice larger that the average degree?

Problem 2. Consider $G_{n,p}$, an Erdös–Rényi random graph with n nodes, m edges, and mean degree c:

a) Compute the probability p of creating an edge in $G_{n,p}$.
b) Show that in the limit (large n) the expected number of triangles in $G_{n,p}$ is $1/6 \cdot c^3$