CS 485 Assignment 1, due Feb. 3

1. Find a data set in machine readable form that can be interpreted as an undirected graph.

a) Give reference.

b) What is the degree distribution of the undirected graph?

c) Write a program to find the connected components. How many components of each size?

2. Use Matlab to plot $\binom{n}{d}$ for n=100. What is the mean? What is the standard deviation? How many standard deviations from the mean does one need to go to essentially contain all the probability mass?

3. In $G\left(n, \frac{1}{n}\right)$ what is the probability of a vertex of degree logn?

4. Let $\omega(n)$ be a function of n. What is the value of $\lim_{n\to\infty}\left(1-\frac{\omega(n)}{n}\right)^n$ if $\lim_{n\to\infty}\omega(n)\to\infty$? If $\lim_{n\to\infty}\omega(n)=\text{constant}$? If $\lim_{n\to\infty}\omega(n)\to 0$?