

CS 422 (Spring 2008)
Homework #2 (due: 1/31/2008, in class)

1. In what ways is a computer virus similar to and different from a computer worm?
2. Consider a simplified large-scale network in which each host has d direct neighbors. Assume that in the case of a worm attack, each infected host will spread the worm to all its uninfected direct neighbors in δ time. If we start with one infected host at the center of the network graph (assume that the graph has no cycle), what is the rate at which the worm spreads in the beginning? How well will the above topology model describe the existing Internet?
3. Besides the network topology, what other factors (other than the vulnerability of hosts to software/administration errors) will determine the spreading speed of a worm in the Internet? Use the Code Red Worm and Sapphire Worm as illustrating examples.
4. We say that a core network operator in the real world will typically *overprovision* the capacity of its network. Justify the decision.
5. Read K & R Chapter 2.