Outline for November 21, 2003

**Reading**: Chapter 18.2, 22.1–22.2

**Discussion Problem**

The UNIX operating system (and most computer systems) have an all-powerful user (*root* or *administrator* or *wheel*).

1. Why does such a user exist?
2. Dennis Ritchie called the existence of this user “both a theoretical and practical flaw.” Why?
3. If you were designing an operating system with security being a key goal, could you avoid creating such a user? If so how? If not, how would you implement the functionality of the *root* user?

**Outline for the Day**

1. Life cycle: Waterfall Model
   - a. Requirements definition and analysis
   - b. System and software design (system design, program design)
   - c. Implementation and unit testing
   - d. Integration and system testing
   - e. Operation and maintenance
2. Other life cycle models
   - a. Exploratory programming
   - b. Prototyping
   - c. Formal transformation
   - d. System assembly from reusable components
   - e. Extreme programming
3. Malicious logic
   - a. Quickly review Trojan horses, viruses, bacteria; include animal and Thompson’s compiler trick