CS 3500 **Written Homework 2** Due Friday 9/11

Read Tanenbaum, Bos: Chapter 2.1, 10-10.2

Exercises

1. Why does Linux distinguish between `stdout` and `stderr` even though both print to the screen by default?

2. Suppose a user runs a program with the statement `while (1);`
   What hardware mechanism prevents this one process from keeping control of the CPU forever?

3. Explain the purpose of each of these Unix pipelines:

   (i) `ls -a | wc -l`

   (ii) `yes mississippi | cat -n`

   (iii) `ps aux | cut -d' ' -f1 | sort -u`

   (you'll probably need to read some man pages)

4. In question 3, how many processes were created by each command?

5. Suppose an OS has a 32-bit counter that it uses to generate PIDs. Each time a new process is created, the counter is incremented and the new value is used as the PID. What is the problem with this method?

6. How many hee's, ha's and ho's will the following program output:

   ```
   main()
   {
     fork();  cout << "hee " << endl;
     fork();  cout << "ha " << endl;
     fork();  cout << "ho " << endl;
   }
   ```

   Now suppose you remove the `endl`'s from each line. How many hee's, ha's, and ho's are output?