CS 194   S. Shenker
Spring 2005   I. Stoica

Homework Assignment #1—February 24, 2005 @ 11:59:59pm

Total: 10 points

1. (**6 points**) Problems from Tanenbaum & Steen book. (1 point for each problem)
   a. Chapter 2 – Problem 15 (page 133)
   b. Chapter 2 – Problem 16 (page 133)
   c. Chapter 3 – Problem 1 (page 180)
   d. Chapter 3 – Problem 14 (page 181)
   e. Chapter 4 – Problem 11 (page 240)
   f. Chapter 5 – Problem 7 (page 289)

2. (**2 points**) Consider an application that runs 100 user level-threads, and 5 LWPs (i.e., kernel level threads) on a uni-processor machine. Each user-level thread performs a 10ms computation, blocks for 100ms waiting for the completion of an I/O operation, and then performs another 10ms computation before terminating.
Assume the context switching time is negligible.
   a. How long does it take for all threads to complete? (**1 point**)
   b. How does the answer at point (a) changes if the application uses 10 LWPs? What if the application uses 20 LWPs? (**0.5 points**)
   c. How does the answer at point (a) changes if the application runs on a two processor machine? (**0.5 points**)

3. (**2 points**) A client wants to synchronize with a time server. It records the roundtrip times and timestamp returned by the server in the table below.
   a. Which of these times should it use to set its clock, and to what time should it set it? Estimate the accuracy of the setting with respect to the server clock. (**1 point**)
   b. If you know that the time between sending and receiving a message in the system is 8ms, do your answers change? (**1 point**)

Round-trip (ms)	Time (hr:min:sec)
22	10:54:23.674
25	10:54:25.450
20	10:54:38.342

Submissions instructions:
1) Create a directory hw1 in your cs194 class account.
2) Create a text file hw1.txt in that directory.
3) Edit the file hw1.txt with your answers.
4) Once ready to submit, run "submit hw1" from the hw1 directory