CS4320 (Principles of Operating Systems): Extra-Credit Homework Problems

Assigned: December 5.

Due: Accepted until 5pm December 14; not accepted later.

Credit: Maximum of 24 points.

Problems

Turn in hardcopy answers (either handwritten or generated by your favorite word-processing or text-formatting program) to any or all of the following problems. You may answer as many or as few as you like.

1. (2 points)

   Exercise 2.5 from Silberschatz and Galvin.

2. (2 points)

   Exercise 4.3 from Silberschatz and Galvin.

3. (2 points)

   Describe the mutual-exclusion problem (also known as the critical-section problem) and give an example of a situation in which a solution to this problem is needed.

4. (2 points)

   Exercise 5.4 from Silberschatz and Galvin.

5. (2 points)

   Describe the bounded-buffer problem and give an example of a situation in which a solution to this problem is needed or would be useful.

6. (2 points)

   Consider the system described in exercise 8.6 from Silberschatz and Galvin. What advantages and disadvantages does this system have compared to the simpler system (one base-limit register pair) described on p. 245?

7. (2 points)

   Exercise 8.16 from Silberschatz and Galvin.

8. (2 points)

   Consider a system in which logical addresses are 31 bits and pages are 4096 bytes. (Note that $4096 = 2^{12}$.) What is the minimum size (in bytes) for each page-table entry? How many bytes (assuming this minimum size per entry) are required for each process's page table?

9. (2 points)

   Exercise 10.6 from Silberschatz and Galvin.

10. (2 points)

    Exercise 11.2 from Silberschatz and Galvin.

11. (2 points)

    Exercise 11.4 from Silberschatz and Galvin.

12. (2 points)

    Exercise 12.1 from Silberschatz and Galvin, modified to read "some advantages/disadvantages" (rather than "three advantages/disadvantages").