CS4411 Exam 1 Study Guide

1. Identify the following concepts.

• operating system • process • PCB • context switch
• scheduling • dual mode operation. • mode bit
• trap. • interrupt. • exception

2. In what regards the design decisions that drove the creation of UNIX system calls and library functions:
• What motivates the "need" for these two levels of service?

3 . Explain how each of the following scheduling algorithms works. Be able to discuss how each one affects CPU utilization, job throughput, turnaround time, waiting time, and response time. Discuss how preemption might apply to each of the algorithms and what effects it might produce on the performance of the system.
• first come, first served
• shortest job first
• shortest remaining time first
• round robin
• priority
• multilevel queue

4. How does the use of preemption and priority levels affect the behavior and the performance of the scheduling algorithms above?

5. What is the difference between user mode and kernel mode? How does the system keep track of which mode it's operating in?

6. What information about processes does the operating system need to store in order to implement multiprogramming? Where is this information stored?

7. List the states that a process may be in. Draw a diagram showing the possible transitions between theses states and identifying what causes state transitions.

8. From the perspective of the operating system, explain what is involved in the creation of a UNIX process (that is, what data structures are used, what is the sequence of operations in the creation process).

9 Explain how the pipe() system call works. Show how a programmer creates pipes to enable the communication between two processes.

10 Explain how dup( ) system call works using the file table and file handle.

11 Understand how fork( ) works.

12. What happens during a context switch? Why can frequent context switches be a problem?