

Operating Systems

Problem Set 2

1. Discuss conditions under which state transitions between READY, BLOCKED, READY-SWAPPED and BLOCKED-SWAPPED states in the process state transition diagram takes place.
2. What are the typical entries in the process control block (PCB)? Suppose you are a computer architect. Suggest some design approaches that can reduce the context switch overhead between processes.
3. Give examples of CPU-bound and I/O-bound processes.
4. What are the main differences between short term, medium term, and long term schedulers?
5. Write a code segment in C/C++ where a parent forks two child processes, the child processes execute some designated tasks, and the parent waits for the termination of the two child processes, before printing the message "**Parent exiting ...**".
6. Consider a code segment in C/C++ where a parent forks a child process; the child counts the number of words stored in a text file. Suggest a method using which the child can return the number of words counted back to the parent.
7. With respect to two concurrent processes, explain how race condition can occur with the help of an example.
8. Write a C/C++ code segment where a parent process creates a shared memory segment and populates it with some data. It then creates two child processes, which attaches the shared memory segment to their address spaces and carries out some computation.