

Operating Systems

Spring, 2002

Do all problems.

1. The UNIX file system maintains information about files (so-called "meta-data," such as time last written, size, etc.) in i-inodes. The DOS file system maintains similar information in the directory entry for the file. Explain the principle advantage of each method versus the other.
2.
 - (a) Virtual memory was invented to solve which problem?
 - (b) Explain the purpose and operation of "page tables".
 - (c) Explain at least one technique that is used to prevent page tables from becoming too large.
 - (d) What technique is used to prevent access to page tables from slowing memory access too much?
3.
 - (a) Semaphores and monitors are equivalent in power; i.e., one can simulate the other. Despite this equivalence, monitors were created in reaction to the difficulty of using semaphores to write concurrent programs. Explain why and how monitors are regarded as easier and more reliable to use to express synchronization conditions.
 - (b) Explain the operation of the wait() and signal() operations of a monitor.
4. Explain the primary advantage and disadvantage of the concept of memory-mapped files.