

Make sure to study the review sheets for exams #1 and #2. Material from these two study sheets may appear on the final.

1. Explain tree structured page tables. Give an example of page translation using three levels of page tables. Discuss the problems with 64-bit addresses.
2. Discuss the differences between using a single virtual address space for all processes, and multiple address spaces, one for each process. How can memory be shared between processes if each process has its own address space.
3. Give the details of the three page replacement algorithms: First In First Out (FIFO), Least Recently Used (LRU) and Optimal (OPT). Demonstrate the algorithms on the reference string assuming you have 3 page frames:
1 1 2 3 1 4 1 1 2 3 5 1 2 3 4 5 1 1 1 1
4. Explain Belady's Anomaly and what it means for certain page replacement algorithms.
5. What are the rules that an algorithm must obey to be a stack algorithm? Why are stack algorithms good?
 - a. Referenced page comes to top
 - b. Nothing below referenced page moves
 - c. Nothing above referenced page can move up, but it can move down.
 - d. Pages not in memory are assumed to be at the bottom of the stack.
4. Assume you are given a hard disk containing a number of important files. The hard disk is from an unknown operating system. What would you expect to find on the hard disk? Assuming that your task is to read the hard disk and save the files to a Microsoft Windows disk, what information would you need to obtain to do this? You may assume that you have a hex-dump of the entire disk, but NO other information.
5. Explain the structure of a directory. What information would you expect to find there?
6. Explain the three different file organizations: Linked List, Indexed, and Multiple Contiguous Blocks. Which is best?
7. What functions must an operating system provide to support sequential character-by-character reading of disk files?
8. How does the NTFS file system differ from other file systems? What is journaling? What is the directory structure?