CSE2005-Operating Systems Lab

Assessment-4 Questions

Memory Management

(a) Consider a memory hole of size 1kb initially. When a sequence of memory request arrives as following, illustrate the memory allocation by various approaches and calculate the total amount memory wasted by external fragmentation and internal fragmentation in each approach.

i. First fit; ii. Best fit iii. Worst fit (**Easy)**

(b) Write a program to implement the page replacement algorithms.

i. FIFO ii. LRU iii. OPT **(Medium)**

(c) Write a program that implements the FIFO, LRU, and optimal pager replacement algorithms. First, generate a random page-reference string where page numbers range from 0 to 9. Apply the random page reference string to each algorithm, and record the number of page faults incurred by each algorithm. Implement the replacement algorithms so that the number of page frames can vary from 1 to 7. Assume that demand paging is used. **(High)**

File system and Disk Management

(a) Implement the following Disk scheduling algorithms:

i. SSTF ii. SCAN iii. C-SCAN iv. FCFS **(Medium)**

(b) Consider a file of size 1 MB. The size of a disk block is 512Bytes. Assume any number of available free blocks in the disk contiguously or non-contiguously. Implement the following algorithms to perform file allocation. Determine the efficiency of each file allocation strategies.

i. Sequential
ii. Indexed
iii. Linked **(High)**