Northern Michigan University (Marquette Co, MI)
CS 426-01-26F: Operating Systems

Program 5
Due: Friday 13 November 2026 3:00 P.M. EST

Create a directory called “PG5” in the root of your CS426-01-26F folder. When you are ready for your program to be graded, put a (possibly empty) file in the root of your PG5 folder called “DONE”.

Virtual Memory Part 1

Your program asks the user to enter the number of bytes per page. Your program will keep track of a (theoretically) unlimited number of pages with that number of bytes.

For example, if the pages are 100 bytes long, then byte 12345 on this system will be byte 45 of page 123. If the pages are 50 bytes long, then byte 100 will be byte 0 of page 2.

Your program then asks the user for the number of pages that can be held in memory at one time. At the beginning, assume no pages are loaded into memory.

Then you will receive a series of commands ACCESS *n* MODIFY *n*. ACCESS will access the specified byte. MODIFY will modify the specified byte. What the bytes actually are is irrelevant to this assignment and you shouldn't bother keeping track of that.

If the page accessed or modified is already in memory, you don't need to print any sort of reply. If it is not in memory, it will need to be swapped in. If there is no room for the new page, another page will have to be swapped out, and you should use the LRU strategy for deciding which page should be swapped out. A page that is to be swapped out isn't *really* swapped out if it hasn't been modified since it was swapped in. It's removed from memory in that case, but not really swapped out. The ACCESS and MODIFY commands must list which pages have been swapped in and swapped out to make the command work. But if no swapping is required, then nothing needs be printed.

If the user enters a blank line, the program should terminate.

Be sure your program is well-commented!