

CSCI 3310 – Page Replacement Exercises

Consider the page request reference stream shown below:

A B C A B D A D B C A

Suppose that the machine servicing this reference stream has three frames of physical memory to use. In class, we simulated this scenario using a basic FIFO (first-in-first-out) page replacement policy and found that this policy resulted in 7 page faults.

1. Starting from an empty memory, simulate the behavior of the MIN (aka OPT) page replacement policy on this reference stream. How many page faults occur?
 2. Perform the simulation again, this time using a LRU (least-recently-used) policy. How many page faults occur?
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Now consider a second reference stream consisting of a repeating pattern, as shown below:

A B C D A B C D A B C D ...

3. Again from an empty memory, calculate the number of page faults with three physical frames and LRU replacement (just for the first 12 page requests of the pattern). How do you explain the resulting behavior?
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Consider the reference stream shown below:

A B C D A B E A B C D E

4. Calculate the number of page faults using FIFO, assuming that your machine has three physical frames of memory.
5. Suppose that you decide to expand your memory by adding a fourth frame of physical memory. Repeat the calculation with four frames using FIFO. How many page faults result?