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CS 1550

Project 3

**Part 1**

There are graphs of how the number of page faults changed from changing the number of frames and the page size in the excel document. For page size and number of frames, the number of page faults decreased as they increase. The number of page faults decreases more from increasing the number of frames. Page size has a larger effect on the number of page faults when the number of frames is lower. At 8 frames, the difference between LRU and OPT page faults didn’t decrease by much when page size was increased. At 64, this difference increased drastically. The number of frames, however, always decreased this difference by a lot no matter what the page size was. At 64 frames and 32 KB, the number of page faults for LRU was almost equal to OPT. In general, it is better to first increase the number of frames as this lowers page fault frequency more. If the number of frames being used is already high, then increasing page size is very beneficial.

**Part 2**

The OPT algorithm is implemented by finding which address is used again last. This address is picked to be removed from the page. Because a computer can’t know this while running normally, it is only possible in theory. My implementation assigned a value called next to every memory access in the trace file. Next is a number that stores the next iteration that memory location will be used. It assigns these values before the actual page replacement algorithm occurs. When the page replacement algorithm decides which value to evict, it finds the largest next value. The algorithm also keeps a linked list like LRU so it can still make a decision when there is a tie. This algorithm does run in exponential time but it’s still able to run in under a second with the given trace files.