Project 3 Report

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Versions and Dependencies:

- GCC: 12.2.0

Compiling & Running:

- To compile the code:
  `cd project-3---virtual-memory-future-gadget-lab`
  - For Part 1:
    `make part1`
  - For Part 2:
    `make part2`
  - Or compile both parts by:
    `make`
- To Run the code for part 1:
  `./part1 BACKING_STORE.bin addresses.txt`
- To Run the code for part 2:
  - Second Chance:
    `./part2 BACKING_STORE.bin addresses.txt -p 0`
  - LRU:
    `./part2 BACKING_STORE.bin addresses.txt -p 1`

Project Separation:

Ahmad worked on part 1. Omar worked on part 2

Implementation:

To get the offset bits we did (logical_address & offset_mask) and ((page_mask & logical_adress) >> 10) to get the logical_page. If we get a page fault while searching the page table we do physical page = to the next free page. We copy the memory segment from backing to the main memory using memcpy and we put the physical page in the page table. We then add to the tlb. It uses the second chance algorithm it keeps going through the array until it finds a value with the reference bit set to 0 or that is not set to anything. In the search function we set the reference bit to 1 if we find the logical page.

In part 2 we created a new variable named Frames and set it to 256. We created 2 functions one is the second chance and the other is the least recently used. Each function does what it is supposed to do. The rest of the code is similar to part 1.