

Your name and company name: Abid Bakhtyar  
 Repository <https://github.com/Abecad97> /Virtual-Memory  
 Verify each of the following items with a corresponding checkmark. Incorrect items will incur a 5% penalty on the grade.

| Complete                            | Incomplete                          | CPSC-351: project 2: Virtual Memory  |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Created the Virtual Memory project in C or C++ to translate logical to physical addresses for a virtual address space of $2^{16}$ (65,536) bytes, using a page table and a TLB, using the specifications in this project assignment.   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Created a page table of $2^8$ entries, with a page size and a frame size of $2^8$ bytes, i.e., having a total of 256 frames, and a total physical memory of 65,536 bytes (256 frames times 256 bytes per frame).   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Program can read logical addresses and translate them to their physical addresses using a page table.  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Program can use a TLB and a page table to translate logical to physical addresses. The page number is extracted, then the TLB is consulted. In the case of TLB hits, extract the frame number from the TLB; for TLB misses, extract it from the page table (see figure).   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Program implements demand paging, it handles page faults by reading in a 256-byte page from backing store file <code>backing_store.bin</code> (a file of 65,536 bytes), and updating the page table and TLB.   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Uses standard C library functions <code>fopen()</code> , <code>fread()</code> , <code>fseek()</code> , and <code>fclose()</code> .   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Your program reads the 1,000 logical addresses (you read that correctly!) from file <code>addresses.txt</code> , and translates them correctly to physical addresses using <code>getpage()</code> and <code>getoffset()</code> . Assertions for correct output against file <code>correct.txt</code> all pass.                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | After completion, your program reports the page-fault rate, and the TLB hit rate.  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Once other elements of your program all work, modify your program to use virtual memory by modifying the physical address space to be smaller (use 128 page frames instead of 256). This will require your program to keep track of free page frames, and to implement the FIFO page-replacement policy (see section 9.4 of Silberschatz). |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Implement a different virtual memory policy using the LRU page-replacement policy.   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Understand the code structure to the degree that the student could rewrite any section of the code from scratch.   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Project directory pushed to new GitHub repository listed above using GitHub client.  |

## Your comments (required)

Reading in the file and finding the page and offset wasn't too bad, but translating from virtual to physical was complicated to understand. Furthermore, I ran out of time and was unable to implement LRU-Page Replacement. My code uses Fifo