**Project 4 Report**

Explanation:

Constants such as `VM\_SIZE`, `PAGE\_SIZE`, `TLB\_SIZE`, and `MM\_SIZE` define the size of virtual memory, page size, TLB size, and main memory size respectively. The program expects a filename as a command-line argument. It opens the file in read mode and checks if the file opening is successful. If not, it prints an error message and exits. We then initialize a few variables. The TLB and page table are initialized using `memset()` to -1, indicating empty entries. The program reads the input file line by line using `getline()`. Each line represents a logical address. For each logical address, the program extracts the page number and offset. It then checks if the page number is present in the TLB. If found in TLB, it's a TLB hit. Otherwise, it searches the page table. If found in the page table, it updates the TLB with the corresponding entry. For each logical address, the program prints the virtual address and the corresponding physical address. After processing all logical addresses, the program calculates hit rates and miss rates for TLB and page table. Finally, it prints out the hit rate and miss rate for TLB and page table.

Sample output:

VIRTUAL ADDRESS = 123456789 PHYSICAL ADDRESS = 21

TLB HIT

VIRTUAL ADDRESS = 123456790 PHYSICAL ADDRESS = 22

TLB HIT

So on..

TLB HIT RATE= 80.00 %

TLB MISS RATE= 20.00 %

PAGE TABLE HIT RATE= 0.00 %

PAGE TABLE MISS RATE= 100.00 %