# Project 5 Virtual Memory Manager

# Function Prototypes: Exercise Handout

We design the following functions from the data flow diagram (see also Project 5 Data Flow Diagram.pdf). Please note that:

* Each module in the data flow diagram is translated into one function.
* The asterisk of a parameter indicates that the parameter is an output.
* These are suggested functions. You are encouraged to adopt and extend these function prototypes for your project.
* Each function returns an error code.

1. **Purpose:** read a list of logical addresses from an input file.
2. **Purpose:** extract a logical address into (1) page number and (2) offset.
3. **Purpose:** check TLB to see if there is a TLB hit or not.
4. **Purpose:** search the page table and determine if there is a page fault or not. This function should be a simple one. It may call page fault handler (see function 5).
5. **Purpose:** handling a page fault. Load a 256-byte page from backing\_store into the simulated main memory.

1. **Purpose:** create a physical address from frame number and offset.
2. **Purpose:** This function reads one byte from physical memory; it is a trivial function.
3. **Purpose:** Store a record of logic-physical address pair and its value into the address\_value\_list.
4. **Purpose:** Output the address-value list into an output file.
5. **Purpose:** Load a 256-byte frame from the backing\_store into the simulated main memory.
6. **Purpose:** implement a TLB replacement policy (e.g., FIFO and LRU) . If there is a free entry in TLB, no TLB replacement will occur; otherwise, the oldest entry will be replaced.

# Function Design Questions:

1. Where are the counters to keep track of the total number of TLB misses and the total number of page faults?
2. Please update your data flow diagram to address the question 1.
3. If you decide not keep the above two counters as two global variables, how will you pass these two counters among the suggested functions?