HUMBER COLLEGE **WINTER 2017**
COMPUTER ARCHITECTURE **LAB 3**

Virtual CPU (User Interface)

Part 1: Virtual CPU Interface

Declare the computer memory as an array of bytes. At this time, the size will be 16Kbytes.

The program should start by displaying an introduction memory which includes your name and implement a simple user interface for the Virtual CPU program.

```
d          dump memory
g          go – run the entire program
l          load a file into memory   (Allows you to specify the file name.)
m          memory modify
q          quit
r          display registers
t          trace – execute one instruction
w          write file
z          reset all registers to zero
?, h       display list of commands
```

Notes: - Upper and lower case characters should work.

Implement the l (load), w (write), h (help) and q (quit) options now and use stubs for the other functions. The load operation will use the LoadFile function to load the contents of a file into the computer memory.

Part 2: LoadFile Function

Write a function that prompts the user for the name of a file and reads it into a buffer. The function will be passed a pointer to the buffer and a max number of bytes to be read from the file (usually the size of the buffer) and will return the number of bytes successfully read. The program should display the number of bytes read from the file (in decimal and hex) and if the file was truncated.

```
int LoadFile(void * memory, unsigned int max);
```

This function will implement the “load” function in Part 1.

Part 3: WriteFile Function

Write a function that prompts the user for the name of a file, prompts for the number of bytes to write and creates the file. The function will be passed a pointer start of the data to be put in the file.

```
void WriteFile(void * memory);
```

This function will implement the “write” function in Part 1.

What you need to do research and add to your report:

- How to read the file into memory.
- Error checking.
- What is the difference between text and binary files?
- You must avoid buffer overflows (file name, contents).

Lab Report

1. Cover Page
2. Report on the testing (Must be a table of tests)
3. Conclusions
4. Copy of the source code