HUMBER COLLEGE **Winter 2017**
COMPUTER SYSTEMS ARCHITECTURE **LAB 6**

Memory Dump and Modify

This lab is designed as 2 weeks lab assignment.
Attendance in the second week is not mandatory.

Implement the d and m options of the CPU user interface. All values will be in hex.

1. Write a memory dump function with the following interface and use the **MemDump** function to implement memory dump in your Virtual CPU. The interface code will prompt the user for an offset and length to be dumped from the CPU memory. The data dumped will depend on what has been placed in memory by the load file function.

void MemDump(void *memptr, unsigned offset, unsigned length)

You will pass a pointer, **memptr,** to the start of a section of memory**.** The **offset** specifies the part to be displayed and **length** specifies the number of bytes to be displayed. The output should be formatted as shown below and display the offset, and the memory contents in both hex and ASCII. Unprintable characters should be represented with a period (".").

Sample Output:
Assuming memptr is a pointer to a section of memory already filled with data,
MemDump(memptr, 0x110, 0x28); could result in the following output.

```
0110  09 49 4E 54 52 4F 44 55 43 54 49 4F 4E 20 54 4F
       .  I  N  T  R  O  D  U  C  T  I  O  N     T  O
0120  20 41 20 50 43 20 4F 50 45 52 41 54 49 4E 47 20
          A     P  C     O  P  E  R  A  T  I  N  G
0130  53 59 53 54 45 4D 0D 13
       S  Y  S  T  E  M  .  .
```

Sample 2: MemDump(filebuffer, 0x12, 0x30)

```
0012  B8 F5 0B 8E D8 BE 00 00 E8 AE 00 E8 1C 00 8B D8
       .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
0022  BE 1C 00 E8 A3 00 E8 11 00 03 C3 BE 38 00 E8 98
       .  .  .  .  .  .  .  .  .  .  .  .  8  .  .  .
0032  00 E8 5F 00 B4 4C B0 00 CD 21 53 51 52 33 C0 50
       .  .  _  .  .  L  .  .  .  !  S  Q  R  3  .  P
```

2. For the memory modify code ask the user to enter the starting address. Display the address and the existing value at that location and prompt the user for a new value. If the input is a period (.), exit, if it is a hex value, change the value and increment the address, else increment the address.

3. Develop a testing strategy to test your code and record the testing results in a table.

Hand in a report that includes:

- a title page,
- a brief description,
- a sample output of the two options,
- the summary table of the testing,
- conclusions, and

- a copy of the source code for the two options and MemDump function . As always the program must be properly documented.