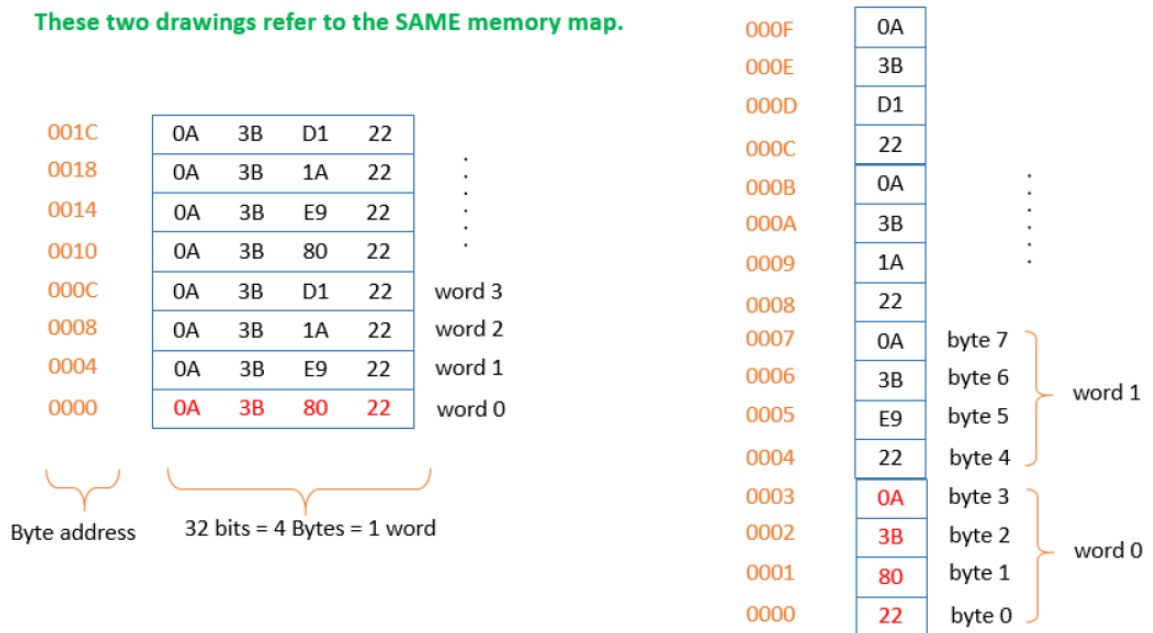


## COMP1047 Lab Week 03

- This part aims to provide with you deeper insights into the memory organization and representation. Observe the figure below for the same piece of memory, which is represented in words and in bytes, respectively. Provide answers to the questions below.

These two drawings refer to the SAME memory map.



- What is the byte address of word number 42? Can you represent the address in Hex format?
  - What are the byte addresses that word 42 spans?
  - Write the MIPS assembly code to load word 3 into \$t0. Hint: (1) Use lw; (2) Use \$t1 to contain the address of word 3 directly.
  - Write the MIPS assembly code to add the values in word 0 and word 1, and store the result back to word 42.
- Write a program in MIPS assembly which reads three integer numbers  $x$ ,  $y$  and  $z$  from the console, then calculates and prints out  $m$ , the minimum of the three. The following C segment shows how  $m$  can be calculated:

```
m = x;
if (m > y) m = y;
if (m > z) m = z;
```

3. Write a program in MIPS assembly language to read two integer numbers A and B. The program should indicate if one of these numbers is multiple of the other one. Hint: You may need to use the “div” and “mfhi” instructions, whose definition can be found from the MIPS reference card. Note for “div”, the “Lo” and “Hi” are two special registers that are used to store the results of division and multiplication operations.
4. Given two integer arrays A and B, in which each integer is represented in 32-bit two's complement format. Assume that A and B are defined as follows.

```
.data
A:    .word 4 6 12 -8 5
B:    .word 3 2 1 4 0
```

Update  $B[0] = 2 * A[3] + B[4]$  and then print out all elements in B.