

Lab 2 - Memory

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CS311 - Computer Architecture 1

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The second laboratory exercise requires you to assign and transcribe different data types in **yasm** assembly language.

Please create a file named **memory.asm** in ebe (or in any text editor of your choice).

Using the codes from Chapter 2, create the **.data** segment in your file.

Question 1 - .data section.

The lab requires you to code different numbers in the **.data** segment. There are generally four different types:

- **db** - byte (1 byte)
- **dw** - word (2 bytes)
- **dd** - double word (4 bytes)
- **dq** - quad word (8 bytes)

The task is the following:

1. Choose a number within this range ($2^5 - (2^7 - 1)$). Allocate this number using the three different types of **db**, **dw** and **dd**. Use labels **a**, **b** and **c**.
2. Choose a floating point number within this range ($2^4 - 2^6$). Use at least three decimal points (non-zero values). Allocate this number using the **dd** type. Use label **d**.
3. Assign an array of 20 bytes, initialized to 10. Use label **e**.
4. Given the number 32452_D , assign it using the minimum data type in base-16. Use label **f**.

Computation

Use either the **ebe** interface or command line (makefile) to generate the machine code as **memory.lst**. In this file, you will have three fields (columns). The first column is the memory locations, the second column is the values translated into base-16, however reversed. The third column is the **yasm** instructions itself.

For each instruction in Question 1, convert the number into base-16 and verify it with column 2. Save this computation in the file **computation**. Show all working.

Submission

The student must submit the following separate files to canvas:

1. **memory.asm**
2. **memory.lst**
3. **computation**

The three files must be submitted through Canvas by 5pm October 7, 2016. The penalty for late submission is 10% for 1 day, 20% for 2 day, after which it will be zero. The grading rubric is given in Table 1.

Table 1: Grading rubric

File	Aspects	Points
memory.asm	Compiles	5
	Correct values used	25
	Code commenting	15
memory.lst	Submission	5
computation	Correct translation to base-16	30
	Proper explanation	20