Exercise 1: Memory Layout

```
A       db      "c", "af", 27o, 0
B       dd      1011b
C       times 2 dw      -27
D       db      043h, 0AAh
E       dw  043AAh
F       dw  -34o, 0
```

1. What are the contents of the 21 memory bytes starting at address , in hex, on a machine that uses Little Endian?
   A db (byte)

   - ”c”: 63
   - ”a”: 61
   - ”f”: 66
   - 27o: 17
   - 0: 00

   | 63 | 61 | 66 | 17 | 00 |
   B dd (double word)

   - 1011 b (binary): 0000 000B

   C 2 times dw (word)

   - 27 = 16(1) + 11
   - 1 = 16(0) + 1
   - 001B
   - FFFF - 001B = FFE4
   - FFE4 + 1 = FFE5
   - FFE5 FFE5

   D db (byte)

   - 43 AA

   F dw (word)

   - -34o (octal) $\rightarrow$ -28_{10}
   - 28 = 16(1) + 12 (C)
   - 1 = 16(0) + 1
   - FFFF - 001C = FFE3
   - FFE3 + 1 = FFE4

- 0: 0000

|63|61|66|17|00|0B|00|00|00|$E5$|FF|$E5$|FF|43|AA|AA|43|$E4$|FF|00|00|
A B C D E F

2. For each label say if it would lead to different byte orders on a Big Endian machine
   Yes, on Big Endian the order will be different.
   |63|61|66|17|00|00|00|00|0B|$E5$|FF|$E5$|FF|43|AA|43|AA|FF|$E4$|00|00|
   A B C D E F

Exercise 2: Memory and Registers

```
L1       L2       L3       L4       L5
04 FE 3A AA 50 41 03 FE FF FF FF 12 42 03 F2 F4
```

After the code nishes executing, what are the contents of the 16 memory bytes starting at address L1, on a machine using Little Endian?

mov eax L2

```
L1          L2          L3          L4          L5
04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | FF | FF | 12 | 42 | 03 | F2 | F4|
             |
             eax - |XX|XX|XX|XX|
```

mov ebx L3

```
L1          L2          L3          L4          L5
04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | FF | FF | 12 | 42 | 03 | F2 | F4|
                          |
                          ebx - |XX|XX|XX|XX|
```

inc ebx

```
L1          L2          L3          L4          L5
04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | FF | FF | 12 | 42 | 03 | F2 | F4|
                               |
                               ebx -|XX|XX|XX|XX|
```

mov ebx [ebx]

```
L1          L2          L3          L4          L5
04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | FF | FF | 12 | 42 | 03 | F2 | F4|

                               ebx - |FF|FF|FF|FE|
```

add eax, ebx

```
L1          L2          L3          L4          L5
04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | FF | FF | 12 | 42 | 03 | F2 | F4|
      |
    eax - |XX|XX|XX|XX|
```

mov ebx [eax]

```
L1          L2          L3          L4          L5
04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | FF | FF | 12 | 42 | 03 | F2 | F4|

                          ebx - |50|AA|3A|FE|
```

mov [L4] bx

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

|

ebx - |50|AA|3A|FE|

mov ax [L5]

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

eax - |XX|XX|03|42|

mov cx [L2]

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

ecx - |XX|XX|50|AA|

add ax, cx

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

ax = ax + cx + 03 42 + 50 AA = 53 EC

mov ecx L1

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

|

ecx - |XX|XX|50|AA

add ecx 2

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

|

ecx - |XX|XX|50|AA|

mov [ecx] ax

L1 L2 L3 L4 L5

04 | FE | 3A | AA | 50 | 41 | 03 | FE | FF | AA | 50 | 12 | 42 | 03 | F2 | F4|

ecx - |42|03|50|AA|

- eax - $|50|AA|53|EC|$
- ebx - $|50|AA|3A|FE|$
- ecx - $|XX|XX|50|AA|$