

CS286 Computer Architecture & Organization

Fall 2026

Exercise Questions for August 26, 2026

QUESTION #1

Suppose that you wrote the following statements in C/C++;

```
int my_int_01;
unsigned int my_int_02;

void main (void)
{
    my_int_02 = 63489;

    my_int_01 = my_int_02;

    printf("my integer: %d\n", my_int_01);
}
```

Assuming that the computers that run this program is a 16-bit architecture computer (i.e., the registers in the processors are all 16 bits), what number will you see when you print the value of "my_int_01" in the program? Show all your work to find the number (i.e., please explain how you got the number). Note that "%d" in the *printf* statement means "print it as a decimal number".

QUESTION #2

For 16-bit architecture computers, what is the largest positive integer the processors can handle? What is the smallest negative integer the processors can handle?

QUESTION #3

Transform the following decimal number to the two's complement binary number (using the 16-bit format: your processor is a 16-bit architecture processor): $-63_{(10)}$. Show all your work.

QUESTION #4

Transform the following decimal number to the two's complement binary number (using the 32-bit format: your processor is a 32-bit architecture processor): $-95_{(10)}$. Show all your work.

QUESTION #5

How the binary bit pattern of $-63_{(10)}$ for a 16-bit processor can be extended for a 32-bit register?