

CMPU-224 Lab3 Practice

Spring 2025

1. You are given the following 6-bit two's-complement number.

100110

(a) What is the decimal value of this number?

(b) What is representation of that number as a 10-bit two's-complement number? Give your answer as in hexadecimal.

2. You are given the following 6-bit two's-complement number.

001100

(a) What is the decimal value of this number?

(b) What is representation of that number as a 10-bit two's-complement number? Give your answer as in hexadecimal.

3. For this question, assume all the numbers are internally represented as 6-bit two's complement binary numbers.

(a) What is the decimal value of $30 + 12$?

(b) What is the decimal value of $-22 + -22$?

(c) What is the decimal value of $-20 \gg 3$?

4. Consider a 10-bit floating point representation called “Tiny Float”.
The bits are arranged as follows:
Bit 9: Sign bit (S)
Bits 8–5: Exponent (E)
Bits 4–0: Fraction (F)

Convert the decimal number -13.5 into the 10-bit Tiny Float representation.

(a) Convert the number to fixed-point binary.

(b) Normalize the binary number (show the value in scientific notation like $1.xxxx \times 2^y$).

(c) Determine the values for the Sign bit, Exponent bits, and Significand bits.

(d) Write the final 10-bit binary representation.

Sign	Exponent	Significand

