
Homework #2

4190.308 Computer Architecture

Name: _____

Due Date: Wednesday, March 22, 2023

Student-Number: _____

Submission: electronically on eTL (scan & upload)

Question 1

Hexadecimal, decimal and binary notations

Perform the following number conversions and calculations.

(a) 0x87cb31 in binary notation

(b) 0b110011011110100101010 in hexadecimal notation

(c) 188 in binary notation

(d) 0x1234 + 0x8e in hexadecimal notation.

Question 2

Logical Operations in C

Assume x, y and z have the values 0xB5D2, 0x7E3A and 0x5ABC, respectively. In the following table, fill in the blanks indicating the values of the different C expressions (use hexadecimal notation).

Expression	Value	Expression	Value
x & y	0x3412	x && y	
x y		x y	
x (y & z)		x (y && y)	
~x ~y		!x !y	
x & !y		x && ~y	

Question 3

Integer representations

- (a) Write down the bit pattern of `int i = -4190308`

- (b) Write down the bit pattern of `short s = -5000 >> 8`

- (c) Compute `unsigned char c = 144 + 127`

- (d) Compute `signed char c = -100 - 44`

Question 4

Fixed-point representations

- (a) Represent $\pi = 3.141526535$ in 3.4 fixed-point notation.

- (b) Compute $1.0625 * 2.375$ in 3.4 fixed-point notation.