22C:060 Computer Organization
Sample solution to Assignment 1

(Chapter 1, Exercise 10) Dealing with self-modifying codes is challenging. Debugging can be a nightmare. Codes can be accidentally corrupted too. Security holes are a matter of concern and may be easy to plant. On the other hand, self-modifying codes can provide new opportunities to write innovative codes. (In the early days, they were used to simulate indexed addressing)

(Chapter 2, Exercise 2(c)) $652_{10} = 1621_{7}$

(Chapter 2, Exercise 4(b)) $57.55_{10} = 111001.100011_{2}$

(Chapter 2, Exercise 6(c))

Binary	Decimal	Binary	Decimal
000	+0	100	-4
001	+1	101	-3
010	+2	110	-2
011	+3	111	-1

(* Some of you did not understand the meaning of 3-bit word.)

(Chapter 2, Exercise 34(b))

Original integer 10011001110

After applying Hamming code 1 0 0 1 1 0 **1** 0 1 1 **1** 0 **0 0**

There are four parity bits in positions 1, 2, 4, 8. Their values are chosen so that the even parity is maintained for the following bit combinations:

(8,9,10,11,12,13,14) (4,5,6,7,12,13,14) (2,3,6,7,10,11,14) (1,3,5,7,9,11,13)

Problem 6-7

(a) –11.625 IEEE 754 format 1 10000010 011101 ….0 (23bits)

(b) + 0.15625 IEEE 754 format 0 01111100 010000 … 0 (23 bits)