Cs341 - Lab 3 instructions

Summary
This lab has two parts:

1. Review solutions for problems of lab 2.
2. Assembly language problems,

1) Review solutions lab 2

Problem 1

/*
 * evenBits - return word with all even-numbered bits set to 1
 *   Legal ops: ! ~ & ^ | + << >>
 *   Max ops: 8
 *   Rating: 1
 */

int evenBits(void) {
    int byte = 0x55;
    int word = byte | byte<<8;
    return word | word<<16;
}

Problem 2

/*
 * replaceByte(x,n,c) - Replace byte n in x with c
 * Bytes numbered from 0 (LSB) to 3 (MSB)
 *   Examples: replaceByte(0x12345678,1,0xab) = 0x1234ab78
 *   You can assume 0 <= n <= 3 and 0 <= c <= 255
 *   Legal ops: ! ~ & ^ | + << >>
 *   Max ops: 10
 *   Rating: 3
 */

int replaceByte(int x, int n, int c) {
    /* Mask out current byte value and OR in replacement */
    int n8 = n << 3;
    int mask = 0xff << n8;
    int cshift = c << n8;
    return (x & ~mask) | cshift;
}
Problem 3

/*
 * absVal - absolute value of x
 *   Example: absVal(-1) = 1.
 *   You may assume -TMax <= x <= TMax
 *   Legal ops: ! ~ & ^ | + << >>
 *   Max ops: 10
 *   Rating: 4
 */

int absVal(int x) {
    int mask = x>>31;
    return (x ^ mask) + ~mask + 1L;
}

2) Assembly language problems