HW1 ECE2060 Au 2016

Lectures Covered: Lesson1 - Lesson4

Show all relevant steps. Don’t just write down the answers.

Late HWs will not be accepted. Lecture Students: turn in your HW in class. Recitation students: turn in your HW at the ECE Office Front Desk. HWs turned-in anywhere else will not be accepted.

Show your work on these pages, attach additional pages if necessary.

• Be sure to organize the pages in order and staple them all together, otherwise you will lose one point

• Fill out the following section. You will lose an additional point if you fail to provide these details

Your Last Name_____________________________ Your First Name_____________________________

1. Lecture Student ____________ or Recitation Student__________ (check one)
2. If Recitation then fill out the following
   Name of recitation instruction________________________ Date/time of recitation______________
   Problems start from next page. Each problem is worth 1 point.
1) The bits of \((-43)_{10}\) are to be placed in a 16 bit register (using 2's compliment representation). Show all the 16 bits in this register.

2) The bits of \((52)_{10}\) are to be placed in a 16 bit register (using 2's compliment representation). Show all the 16 bits in this register.

3) Let \(a = (11000010)_{2}\) and \(b = (-3)_{10}\), assume that we are using signed binary numbers (2's compliment representation) stored in 8 bit registers. Let \(c = a + b\).
   i) Show all the binary bits of \(c\)
ii) By using the argument based on "carry out of signed bit" and "carry into the signed bit" determine if there is overflow.

4) Let \( a = (11000010)_2 \) and \( b = (-3)_{10} \), assume that we are using signed binary numbers stored in 8 bit registers. Let \( c = a - b \).
   
i. Show all the binary bits of \( c \)
   
ii. By using the argument based on "carry out of signed bit" and "carry into the signed bit" determine if there is overflow.
5) Express $(10000000)_2$ as a decimal number,
i) If the above number is represented in 2’s compliment representation
ii) If the above number is represented in unsigned numbers representation

6) Express $(37.625)_{10}$ as a binary number
7) Express \((63)_{10}\) as a Hexadecimal number

8) The bits 11101000 are stored in an 8 bit register to represent a signed (2’s compliment representation) binary number. This number is divided by 8 and stored in another 8 bit register. Show all the bits in this register. Use bit shifting to divide by 8.
9) The bits 11110100 are stored in an 8 bit register to represent a signed (2's compliment representation) binary number. This number is multiplied by 8 and stored in another 8 bit register. Show all the bits in this register. Use bit shifting to multiply by 8.

10) Express \((789)_{10}\) as a BCD encoded number