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HOMEWORK 1

CSCE A248 Computer Organization and Assembly Language Programming

Total points towards grade: 5/100

Homework is submitted electronically on the Blackboard. E-mail submissions will not be accepted. Homework must be in PDF (scanned will be accepted).

You need to show your work clearly and step-by-step to obtain credit. Work that is not demonstrated will not earn credit.

57 = 111001
34 = 100010

1) Show that the arithmetic operation -7 + (-30) represented in 2's complement representation gives the same result as the unsigned integer arithmetic operation 57 + 34 (assume a six-bit system, i.e. the register size is 6 bits). What are the values of the carry flag and overflow flag after the operation? (1 point) +7 = 000111 30 = 011110 -7 111001 (1)57 111001 Carry: 1
111000 100001 -30 100010 34 100010
-7 = 111001 -30 = 100010 011011 011011 Overflow: 1

2) Complete the following arithmetic operations. What are the values of the carry flag and overflow flag after each operation? (assume a six-bit system) (1 point)

- 31 + 13 31 = 011111 18 = 010010
- 14 – 18 13 = 001101 101101
  14 = 001110 -18 = 101110

3) Are the following statements true or false if the numbers are represented in 2's complement representation? (1 points)

07-1

- 00000 > 11111 True
- 10000 > 01111 False
- 11100 > 11101 False
- 00010 > 11001 True

10000
01111
10000 = -16 X 15

00011 00010
00100 00011
-4 > -3 X

00110
2 > -7 00111

4) What are the overflow and carry flags of the following operations? (Assume a four-bit system.)

(2 points)

	Result	Carry	Overflow	Reason for carry flag	Reason for overflow flag
1100 + 1010	0110	1	1	Added out of bounds	Added out of bounds
1100 - 0110 1001 1010	0110	1	0	Subtract successful	N/A
0101 + 0111	1100	0	0	N/A	Didn't overflow
0101 - 0111 1000 1001	1110	0	1	N/A	Subtracted out of bounds
1010 + 0111	0001	1	1	Added out of bounds	Added out of bounds