

Name Anna Kurchenko

## HW4: Signed representations and out of range values (CS220-02)

1--7) For each of the following, assume the machine used is a 5 bit machine. Complete the table by identifying how the decimal value on the left would be stored in 5 bits using signed magnitude, 1's complement, and 2s complement representations.

number	Signed Magnitude	1's Complement	2's Complement
-14	11110	$-(+14) = -01110 = 10001$	01110
+21	out of range		
-9	11001	00110	01001
-3	10011	01100	00011
-19	out of range		
+15	01111	10000	10001
-11	11011	$-(+11) = -01011 = 10100$	01011

Signed Magnitude: 1/0 as first bit + 4 bit rep

1's Complement: from binary invert it, done for pos #'s. For neg numbers must consider the negative sign from original string separately, so change the 1 to -, then negate rest of bit string.

8--14) For each of the following 5 bit patterns, identifying the decimal value if interpreted using signed magnitude, 1's complement, and 2s complement encodings.

number	Signed Magnitude	1's Complement	2's Complement
10110	-6	-1001 = -9	01011
11000	-8	-0111 = -7	01000
01010	+10	01010 -> 10101	10110
11110	-14	-0001 = -1	01110
10000	-0	-1111 = -15	01111
01111	+15	01111 -> 10000	10001
11011	-3	-0100 = -4	00011