

Questions:

1. What extra step do we take when we form the 2's complement of a negative binary number? [Answer]
: The extra step we take is adding 1 to our complemented(flipping bits) number.
A good way to remember this is to compare the names of the representation schemes.
2's complement exceeds 1'd complement by 1, so we always dd 1 to our 1's complemented numbers.
2. Write the 2's complement for each of the following 5-bit binary numbers. [Answer]
 1. 01001_2 10111
 2. 01011_2 10101
 3. 00111_2 11001
 4. 00001_2 11111
3. In 2's complement, what do all the positive numbers have in common? [Answer]
: In 2's complement, all the positive numbers begin with a 0.
4. What advantage does 2's complement have over 1's complement? [Answer]
: In 2's complement we have only one way to represent 0. This simplifies our representation scheme and have major advantage for designing hardwares.
5. If you want to write the number 7_{10} using 2's complement representation, what do you need to do? [Answer]
: To write number 7 using 2's complement representation you only need to convert 7 to binary.
6. If you want to write the number -7_{10} using 2's complement representation, what do you need to do? [Answer]
: You need to convert 7 to binary, complement this number and then add 1.
7. What is the general technique for converting a decimal number to 2's complement representation? [Answer]
: 1. If the number is positive, simply convert it to binary.
2. If the number is negative, write the positive value of the number in binary, reverse Each bit. Add 1 to the number.
8. Convert the following decimal numbers to binary using 6-bit 2's complement representation. [Answer]
 1. -16_{10} 110000
 2. 13_{10} 001101
 3. -3_{10} 111101
 4. -10_{10} 110110
 5. 26_{10} 011010
 6. -31_{10} 100001