

## CIT 593 - Exercise on Bits, Data Types and Operations

1. How many distinct values can we represent with 4 bits
2. Convert 11111110 in 2's complement notation to Decimal
3. Convert -128 to 9-bit 2's complements binary numbers.
4. What is the largest positive number one can represent in 5-bit 2's complement code?
5. Add the following unsigned binary numbers 0101 + 110
6. Add the following 2's complement binary numbers and state whether is an overflow  
0111 + 0001
7. Compute the following  
((NOT 0110) OR 0000) AND 1111
8. Write the decimal equivalents for these IEEE floating point numbers
  - a. 0 1000011 000000000000000000000000
9. Convert unsigned 1110110110110010 binary numbers to hex & octal notation

n	$2^n$
0	1
1	2
2	4
3	8
4	24
5	32
6	64
7	128
8	256
9	512
10	1024



$$N = -1 \times 1.\text{fraction} \times 2^{\text{exponent}-127}, 1 \leq \text{Exponent} \leq 254$$

$$N = -1 \times 0.\text{fraction} \times 2^{-126}, \text{Exponent} = 0$$