Number Systems
Binary Coded Decimal

Last updated 8/20/20

Number Systems

- Binary Coded Decimal (BCD)
  - Encode base 10 digits into 4 bit nibbles
  - No negative representation
  - Used in some financial applications

50	→	0101 0000
79	→	0111 1001
37	→	BCD
10010110_{BCD}	→	decimal

Number Systems

- Binary Coded Decimal

convert 37 decimal to BCD

4 bits → bit values of 8 | 4 | 2 | 1

3 → 0011 0 0 1 1

7 → 0111 0 0 1 1 0 1 1 1

37 → 0011 0111 BCD

Number Systems

- Binary Coded Decimal

convert 10010110 BCD to decimal

Break into 4 bit nibbles

10010110 → 1001 0110

1001 → 9
0110 → 6

10010110 BCD → 96

Number Systems

- Binary Coded Decimal
  - Maximum values:
    - 4 bits = 9
    - 8 bits = 99
    - 16 bits = 9999

9	8	7	6	5	4	3	2	1	0
1001	1000	0111	0110	0101	0100	0011	0010	0001	0000

Number Systems

- Binary Coded Decimal
  - Issues
    - No negative values
    - Not efficient – limited range

9	8	7	6	5	4	3	2	1	0
1001	1000	0111	0110	0101	0100	0011	0010	0001	0000