

2020-09-08 Hexadecimal

Monday, September 7, 2020 6:18 AM

Notes from HW1

- Please use CS discord for online communication
- (new requirement) Please take screenshots of hardware simulator test rather than just .out files

Agenda Items

- Possible exam/quiz type questions
 - Given a truth table, draw the associated Logism or write the HDL code

A	B	C	OUT
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

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- Hex representation

Base10	Base2	Base16
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

8-bit numbers fit quite nicely in 2 digit hex numbers

Dec: 201

$$201 - 128 = 73$$

$$76 - 64 = 12$$

X32

X16

$$12 - 8 = 4$$

$$4 - 4 = 0$$

X2

X1

1100-1100

Hex: CC

Example #2

E9

11101001

16^1	16^0
E	9

$$16*(14) + 1 * (9) = 233$$

How large of a hex number is required to represent a 16-bit number?

$$16^2 = 256$$

$$16^3 = 4,096$$

Example #3

ABCD

1010-1011-1100-1101

$$13*1 + 12 * 16 + 11*256 + 10*4096 = 43981$$

10^4	10^3	10^2	10^1	10^0
4	3	9	8	1

$$1*1 + 8*10 + 9*100 + 3*1000 + 4*10000 = 43981$$