Digital Design

Design

A Datapath and Control Approach

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Contents

Chapter 1

Numbering Systems

Helpfull Stuff

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4		4
5	0101	5
6		6
7		7
8	1000	8
9		9
10	1010	A
11		B
12	1100	C
13	1101	D
14		E
15	1111	F

i	0	1	2	3	4	5	6	7	8	9
2^i	1	2	4	8	16	32	64	128	256	512

$11101010 11_2 =$
$1 * 2^9 + 1 * 2^8 + 1 * 2^7 + 0 * 2^6 + 1 * 2^5 + 0 * 2^4 + 1 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0 =$
$2^8 (0 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0) + 2^4 (1 * 2^3 + 0 * 2^2 + 1 * 2^1 + 0 * 2^0) + 2^0 * (1 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0) =$
$2^8 (0011_2) + 2^4 (1010_2) + 2^0 (1011_2) =$
$2^{4*2} (0011_2) + 2^{4*1} (1010_2) + 2^{4*0} (1011_2) =$
$16^2 (0011_2) + 16^1 (1010_2) + 16^0 * (1011_2) =$
$16^2 (3) + 16^1 (A) + 16^0 * (B) =$
$3AB_{16}$