Coccinella

File Edit Preferences Library Info

Save Open Import Send Print Stop

Binary Bits: two combinations

one bit: 0
1

two bits: four combinations

00 0
01 1
10 2
11 3

2^n → 21

00 0
01 1
10 2
11 3

$2^0 = 1$

$2^1 = 2$

$2^2 = 4$

$2^3 = 8$

	Binary	Decimal	Hex
four bits:	0000	0	0
16 Combinations	0001	1	1
	0010	2	2
	0011	3	3
	0100	4	4
	0101	5	5
	0110	6	6
	0111	7	7
	1000	8	8
	1001	9	9
	1010	10	A
	1011	11	B
	1100	12	C
	1101	13	D
	1110	14	E
	1111	15	F

Contact ID: Send Live

Maximum combinations for binary bits

One bit

Binary Bit	Decimal Value
0	0
1	1

Two Bits

2^n	21	Val
	00	0
	01	1
	10	2
	11	3

Three Bits

2^n	421	Val
	000	0
	001	1
	010	2
	011	3
	100	4
	101	5
	110	6
	111	7

Four Bits

2^n	8421	Single Digit Hex Val
	0000	0
	0001	1
	0010	2
	0011	3
	0100	4
	0101	5
	0110	6
	0111	7
	1000	8
	1001	9
	1010	A
	1011	B
	1100	C
	1101	D
	1110	E
	1111	F

Eight Bits

	Bit #	7654	3210
Hex	2^n	8421	8421

Binary -> Decimal Conversion

2^n	128	64	32	16	8	4	2	1		
	1	1	0	1	1	0	1	1	=	219

1101	1011	Binary
D	B	Hex

Burglar Alarm Example

Bit #	Function	Input Bit #	7654 3210
0	Front Door		0000 0001
1	Front Window		0000 0010
2	Rear Window		0000 0100
3	Rear Door		0000 1000
4	Driveway		0001 0000
5	Garage Door		0010 0000
6	Fire Alarm		0100 0000
7	Sprinklers		1000 0000

Bitwise AND Ch10.9

Inputs		Out	OR
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

7 0111
9 1001

Alarm 0xBC
1011 1100 input bits
0001 0000 Drive Mask
0001 0000

```
int MaskFrontDoor=0x01        0000 0001
int MaskFrontWindow = 0x02    0000 0010
int MaskRearWindow = 0x04     0000 0100
int MaskRearDoor = 0x08       0000 1000
int MaskDriveway = 0x10       0001 0000
int MaskGarageDoor = 0x20     0010 0000
int MaskFireAlarm = 0x40      0100 0000
int MaskSprinklers = 0x80     1000 0000
```

```
if (InputBit & MaskDriveway)
{
  // signal driveway alarm
}
```