

Binary

Binary is a number system that only uses two digits: 1 and 0. All information that is processed by a computer is in the form of a sequence of 1s and 0s. Therefore, all data that we want a computer to process needs to be converted into binary.

The binary system is known as a 'Base 2' system. This is because: There are only two digits to select from (1 and 0). When using the binary system, data is converted using the power of two.

128	64	32	16	8	4	2	1
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Example Binary To Denary

8 BIT TABLE

Q : Convert 0 0 0 1 1 0 0 0 to denary

128	64	32	16	8	4	2	1
0	0	0	1	1	0	0	0
			16	8			

Denary

Denary uses a 'Base 10' number system.

Example Denary To Binary

Q : Convert 12 to binary A: 0 0 0 0 1 0 0

128	64	32	16	8	4	2	1
				8	4		
0	0	0	0	1	1	0	0

Adding Binary

When two numbers are added together in **denary**, we take the first number, add the second number to it and get an answer. For example, $1 + 2 = 3$.

When we add two **binary** numbers together the process is different.

There are four rules that need to be followed when adding two binary numbers. These are:

- $0 + 0 = 0$, $1 + 0 = 1$, $1 + 1 = 10$ (said one zero and is binary for 2)
- $1 + 1 + 1 = 11$ (said one one and is binary for 3)

Example

Let's try adding together two binary numbers: 0101 0011 and 0111 0110.

To get to the answer, use the following method:

0 1 0 1 0 0 1 1
 + 0 1 1 1 0 1 1 0

 1 1 0 0 1 0 0 1
 1 1 1 1 1

ASCII

ASCII (American Standard Code for Information Interchange) codes represent text in computers, communications equipment and other devices that use text.

Each character is represented by 8 digits. Last 5 = the number in the alphabet

First three decide whether it is lower, upper or a space

ASCII

A	B	C	D	E	F	G	H
1	2	3	4	5	6	7	8
I	J	K	L	M	N	O	P
9	10	11	12	13	14	15	16
Q	R	S	T	U	V	W	X
17	18	19	20	21	22	23	24
Y	Z						
25	26						

£	10100011
,	00101110
'	00101100
&	00100110

SPACE	001 00000
CAPS	010 ??????
Lowercase	011 ??????

Hexadecimal

This is a quick way to write down binary values in a more manageable way.

This uses a 'Base 16' number system.

Conversion Table

Binary	Denary	Hexadecimal
0000	0	0
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