

Idiots Guides...

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A quick few tutorials i wrote to help me understand stuff really, but i thought i'd share them.

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Chapter 1 - The Binary System

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1 - The Binary System

Pertaining to a number system that has just two unique digits The Binary System:

Pertaining to a number system that has just two unique digits. For most purposes, we use the decimal number system, which has ten unique digits, 0 through 9. Combining these ten digits then forms all other numbers. Computers are based on the binary numbering system, which consists of just two unique numbers, 0 and 1. All operations that are possible in the decimal system (addition, subtraction, multiplication, division) are equally possible in the binary system.

We use the decimal system in everyday life because it seems more natural (we have ten fingers and ten toes). For the computer, the binary system is more natural because of its electrical nature (charged versus uncharged).

In the decimal system, each digit position represents a value of 10 to the position's power. For example, the number 345 means:

3 three 100s (10 to the 2nd power)

Plus

4 four 10s (10 to the first power)

Plus

5 five 1s (10 to the zeroth power)

In the binary system, each digit position represents a value of 2. For example, the binary number 1011 equals:

1 one 8 (2 to the 3rd power)

Plus

0 zero 4s (2 to the 2nd power)

Plus

1 one 2 (2 to the first power)

Plus

1 one 1 (2 to the zeroth power)

So a binary 1011 equals a decimal 11.

Because computers use the binary numbersystem, powers of 2 play an important role. This is why everything in computersseems to come in 8s (2 to the 3rd power), 64s (2 to the 6th power), 128s (2 to the 7th power), and 256s (2 to the 8th power).

Or basically:

Binary	8	4	2	1
Number:				
Power 2:	2 ³	2 ²	2 ¹	2 ⁰
Binary 1				1
Binary 2			1	0
Binary 3			1	1
Binary 4		1	0	0
Binary 5		1	0	1
Binary 6		1	1	0
Binary 7		1	1	1
Binary 8	1	0	0	0
Binary 9	1	0	0	1
Binary 10	1	0	1	0
Binary 11	1	0	1	1
Binary 12	1	1	0	0
Binary 13	1	1	0	1

Programmers also use the octal (8 numbers)and hexadecimal (16 numbers) number systems because they map nicely onto thebinary system. Each octal digit represents exactly three binary digits, andeach hexadecimal digit represents four binary digits, but I'll come onto thesein a later tutorial.

Of course this is all just pure math binary,for displaying characters it is all in 8 bits or a byte. If it is alphanumericit will start in 0, then if it is a number/punctuation it will be 1 or for aletter 0. If it is a letter the next number will be upper/lower case, were 0 isupper and 1 is lower. For Numbers/punctuation 1 is number and 0 is punctuation.Then it is the number assigned to that number/letter/punctuation mark. Which iseasy for letters and numbers-i.e. 1=(start) 00001, 2=(start) 00010 etc. forletters it's a=1= (start) 0001 B=2=00010. Or:

Job:	Character? (0=Y,1=N)	Letter Or No./ Punctuation? (0=No./P,1=L)	Upperor lower/ No. orpunctuation? (0=L/P,1=U/N)	Reference Number
1	0	0	1	00001
2	0	0	1	00010
3	0	0	1	00011
A	0	1	0	00001
B	0	1	0	00010
C	0	1	0	00011

a	0	1	1	00001
b	0	1	1	00010
c	0	1	1	00011
(space)	0	0	1	00000
?	0	0	1	11111

Anyway, I have included all the alphanumeric characters below, along with some everyday useful phrases:

Alphanumeric characters:

A-01000001
 B-01000010
 C-01000011
 D-01000100
 E-01000101
 F-01000110
 G-01000111
 H-01001000
 I-01001001
 J-01001010
 K-01001011
 L-01001100
 M-01001101
 N-01001110
 O-01001111
 P-01010000
 Q-01010001
 R-01010010
 S-01010011
 T-01010100
 U-01010101
 V-01010111
 W-01011000
 X-01011001
 Y-01011010
 Z-01011011

a-01100001
 b-01100010
 c-01100011
 d-01100100

e-01100101
f-01100110
g-01100111
h-01101000
i-01101001
j-01101010
k-01101011
l-01101100
m-01101101
n-01101111
o-01110000
p-01110001
q-01110010
r-01110011
s-01110100
t-01110101
u-01110110
v-01110111
w-01111000
x-01111001
y-01111010
z-01111011

1-00110001
2-00110010
3-00110011
4-00110100
5-00110101
6-00110111
7-00111000
8-00111001
9-00111010

(Space)-00100000
.-00101110
, -00101100
? -00111111

Simple Phrases:

Hello:01001000 01100101 01101100 0110110001101111

How are you?:01001000 01101111 0111011100100000 01100001 01110010 01100101 00100000
01111001 01101111 0111010100111111

My face tastes like cheese:01001101 0111100100100000 01100110 01100001 01100011 01100101
00100000 01110100 0110000101110011

01110100 01100101 01110011 00100000 0110110001101001 01101011 01100101 00100000
01100011 01101000 01100101 0110010101110011
01100101 00101110

Your mum is a fat cow:01011001 0110111101110101 01110010 00100000 01101101 01110101
01101101 00100000 0110100101110011
00100000 01100001 00100000 01100110 01100001 01110100 00100000 0110001101101111
01110111 00111010