ATemplate Week 1 – Bits & Bytes

Student number: 572750

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

A bit is one number that is either a 1 or a 0. 1 byte is 8 bits.

What is a nibble?

A nibble is 4 bits.

What relationship does a nibble have with a hexadecimal value?

A nibble is one hexadecimal value.

Why is it wise to display binary data as hexadecimal values?

Since it will require less space.

What kind of relationship does a byte have with a hexadecimal value?

1 byte is 2 hexadecimal values

An IPv4 subnet is 32-bit, show with a calculation why this is the case.

255.255.255.255 is the maximal value of a subnet. We start with 2^0 is 1 en 2^1 is 2 en 2^2 is 4 you get the idea 2^8 is 256. So that means that 1111 1111 = 255 and 8 times 4 is 32.

Assignment 1.2: Your favourite colour

Hexadecimal colour code: #0000FF

Assignment 1.3: Manipulating binary data

Colour	Colour code hexadecimaal (RGB)	Big Endian	Little Endian
RED	#FF0000	FF 00 00	00 00 FF
GREEN	#00FF00	00 FF 00	00 FF 00
BLUE	#0000FF	00 00 FF	FF 00 00
WHITE	#FFFFFF	FF FF FF	FF FF FF
Favourite (previous assignment)	#0000FF	00 00 FF	FF 00 00

Screenshot modified BMP file in hex editor:

Bonus point assignment – week 1

Convert your student number to a hexadecimal number and a binary number.

Explain in detail that the calculation is correct. Use the PowerPoint slides of week 1.

My student number is 572750. We devide that by 2 and then we get 286375 since there is no number behind the decimal we note a 0 and continue with 286375 and devide this by 2. Then we get 143187,5 since it is 0,5 we note a 1 and now continue with 143187 devided by 2. We do not take the 0,5 since then the calculation will be off. And we continue like this so you get the idea.

572750 ÷ 2 = 286.375	0
286375 ÷ 2 = 143.187,5	1
143187 ÷ 2 = 71.593,5	1
71593 ÷ 2 = 35.796,5	1
35796 ÷ 2 = 17.898	0
17898 ÷ 2 = 8.949	0
8949 ÷ 2 = 4.474,5	1
4474 ÷ 2 = 2.237	0
2237 ÷ 2 = 1.118,5	1
1118 ÷ 2 = 559	0
559 ÷ 2 = 279,5	1
279 ÷ 2 = 139,5	1
139 ÷ 2 = 69,5	1
69 ÷ 2 = 34,5	1
34 ÷ 2 = 17	0
17 ÷ 2 = 8,5	1
8 ÷ 2 = 4	0
4 ÷ 2 = 2	0
2 ÷ 2 = 1	0
1 ÷ 2 = 0,5	1

1000 1011 1101 0100 1110

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

1000 1011 1101 0100 1110
8 B D 4 E

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