Week 1 – Bits & Bytes

Student number: 570215

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

Een bit is een waarde van 1 of 0 binnen een computer. Een byte is een collectie van 8 bits.

A bit is a value in a computer that's either a 0 or a 1. A byte is a collection of 8 bits.

What is a nibble?

A nibble is half a byte, that would be 4 bits.

What relationship does a nibble have with a hexadecimal value?

A singular hexadecimal number consists of one nibble.

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

Hexadecimal values are allot easier to read than regular binary

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

Twee hexadecimal numbers make up a byte.

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

An IPv4 subnet consists of 4 values between 0 and 255. The value 255 is represented with 8 bits. These 4 values together take up 32-bits. This can be seen when you convert an IPv4 subnet to binary, for example the adress: 255.0.0.0 translates to 11111111 00000000 00000000 00000000 in binary.

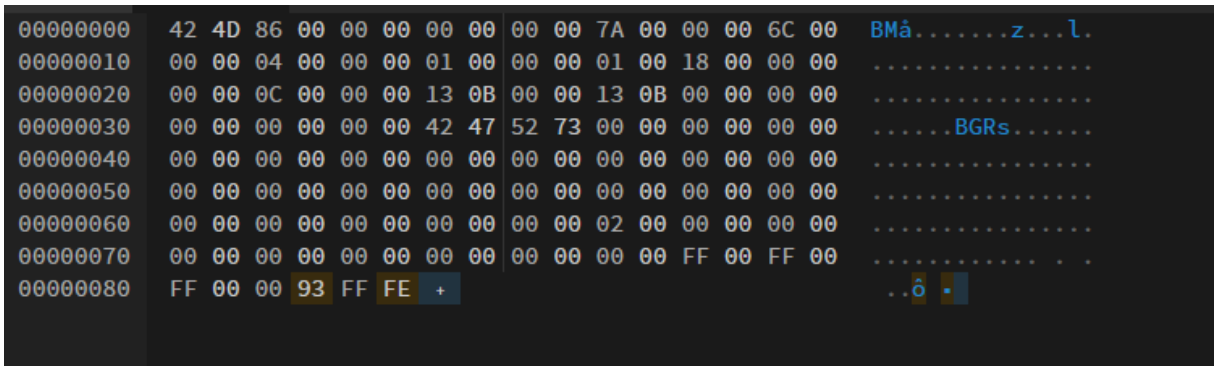
Assignment 1.2: Your favourite colour

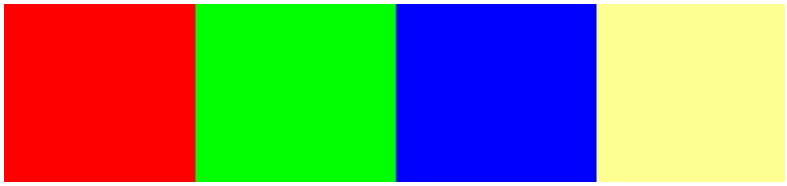
Hexadecimal colour code: feff93

Assignment 1.3: Manipulating binary data

Colour	Colour code hexadecimaal (RGB)	Big Endian	Little Endian
RED	FF0000	FF0000	0000FF
GREEN	00FF00	00FF00	00FF00
BLUE	0000FF	0000FF	FF0000
WHITE	FFFFFF	FFFFFF	FFFFFF
Favourite (previous assignment)	FEFF93	FEFF93	93FFFE

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 (570215**)** converted to Hexadecimal is: 8B367.

I calculated this dividing the number by 16, removing the decimals while noting down the remainders and than repeating that equation until it returns 0. After this is done the remainders can be read bottom to top to create the hexadecimal number.

570215 ÷ 16 = 35638, remainder 7

35638 ÷ 16 = 2227, remainder 6

2227 ÷ 16 = 139, remainder 3

139 ÷ 16 = 8, remainder 11 (B in hex)

8 ÷ 16 = 0, remainder 8

This hexadecimal number can than also be converted to binary by noting down every number individually as a 4 bit binary number and than putting them in order

for example:

8 = 1000

B (11 in decimal) = 1011

3 = 0011

6 = 0110

7 = 0111

So that would mean 10001011001101100111 is the binary conversion of the decimal number: 570215

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