Template Week 1 – Bits & Bytes

Student number: 569681

Assignment 1.1: Bits & Bytes intro

What are bits and bytes?

Bit is een value that can be represented with only zeroes and ones. A byte is a collection of 8 bits.

What is a nibble?

Nibble is half of a byte, 4 bits.

Which relationship does a nibble have with hexadecimal values?

Every hexadecimal value in the base number system is represented in binary with a nibble.

Why is it handy to display binary values in hexadecimal?

Because the hexadecimal values are easier to read and understand than series of zeroes and ones.

Which relationship does a byte have with hexadecimal values?

A byte can be directly translated into two hexadecimal values

Show in a calculation that an IPv4 subnet consists of 32 bits.

IPv4 address consists of 4 octets. Each octet is 8 bits. 4 x 8 = 32 bits.

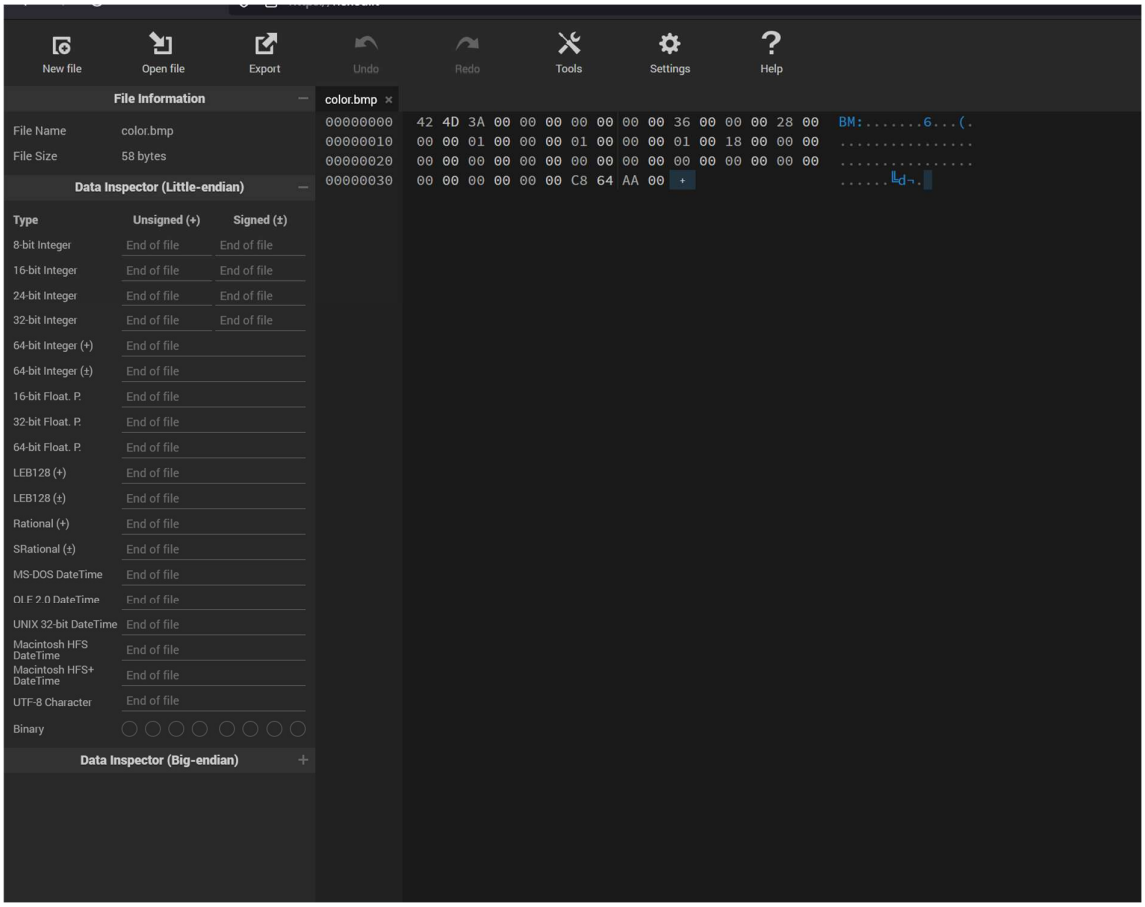
Assignment 1.2: Your favourite color

Hexadecimal colour code: #aa64c8

Assignment 1.3: Binaire data manipulatie

Colour	Colour code hexadecimaal (RGB)	Big Endian	Little Endian
RED	255	0	0
GREEN	0	255	0
BLUE	0	0	255
WHITE	255	255	255
Favourite (previous assignment)	170	100	200

Screenshot modified BMP file in hex editor:



- Made with a simple python script

Bonus point assignment – week 1

Translate your student number into a hexadecimal and a binary value.

Describe the calculation in detail. Make use of the PowerPoint slides of week 1.

569681

To get the binary value of this number, it's necessary to divide the number with 2, until no division is possible.

Number divided by 2	Rest
569681	1
284840	0
142420	0
71210	0
35605	1
17802	0
8901	1
4450	0
2225	1
1112	0
556	0
278	0
139	1
69	1
34	0
17	1
8	0
4	0
2	0
1	1

Once the division is complete, the rest from bottom to top makes the binary value.

This makes: 10001011000101010001 my student number in binary.

To translate this to hexadecimal, number is divided into groups of 4 bits.

1000 1011 0001 0101 0001 makes 8B151 in hexadecimal.