Template Week 1 – Bits & Bytes

Student number: 522880

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

Bits are the basic storage size of a computer, storing either a 0 or a 1

A byte is the combination of 8 of those bits, forming the smallest addressable size on the computer.

What is a nibble?

Half a byte

What relationship does a nibble have with a hexadecimal value?

It can be displayed by one hexadecimal value

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

If you want to save screen space - yes

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

It can be displayed as two hex numbers

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

Highest IPv4 address -> 255.255.255.255 -> 2^8 *2^8 *2^8 = 2^32

Assignment 1.2: Your favourite colour

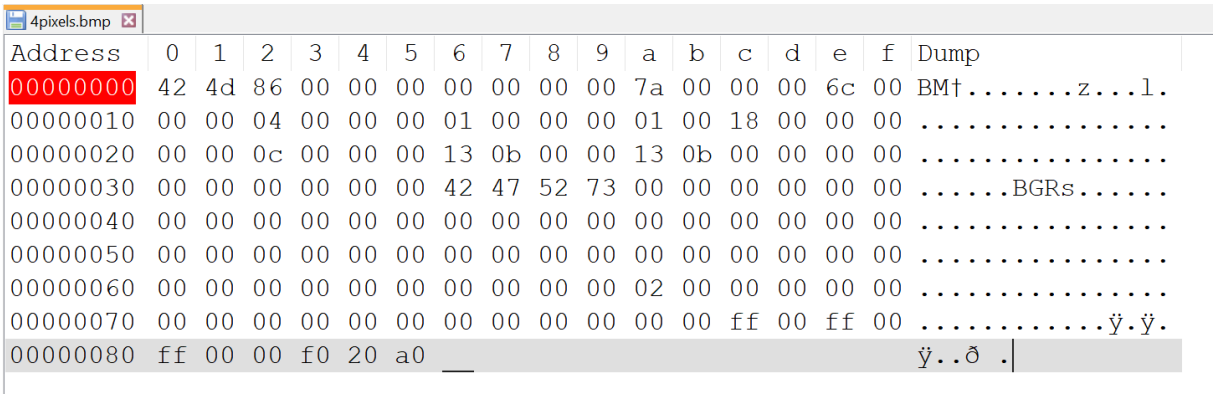
Hexadecimal colour code:

#A020F0

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	FFFFF	FFFFFF
Favourite (previous assignment)	#A020F0	A020F0	F020A0

Screenshot modified BMP file in hex editor:



(THE VALUE IS RECORDED IN BGR DUE TO HISTORICAL REASONS)

(Also I did it in Notepad++ because I'm a bad student)

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.

Binary:

522880 / 2 = 261440 R0

261440 / 2 = 130720 R0

130720 / 2 = 65360 R0

65360 / 2 = 32680 R0

32680 / 2 = 16340 R0

16340 / 2 = 8170 R0

8170 / 2 = 4085 R0

4085 / 2 = 2042 R1

2042 / 2 = 1021 R0

1021 / 2 = 510 R1

510 / 2 = 255 R0

255 / 2 = 127 R1

127 / 2 = 63 R1

63 / 2 = 31 R1

31 / 2 = 15 R1

15 / 2 = 7 R1

7 / 2 = 3 R1

3 / 2 = 1 R1

1 / 2 = 0 R1

Binary = 111 1111 1010 1000 0000

Hex:

Binary => 111 1111 1010 1000 0000

0111 => decimal 7 => hex 7

1111 => decimal 15 => hex F

1010 => decimal 10 => hex A

1000 => decimal 8 => hex 8

0000 => decimal 0 => hex 0

Hexadecimal Number = 7FA80

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