

Template Week 1 – Bits & Bytes

Student number: 590173

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

Bits a single place or symbol in a binary number Each bit can either be 0 or 1.

Byte is group bits together in sets of eight.

What is a nibble?

four bits is half a byte which is a nibble.

What relationship does a nibble have with a hexadecimal value?

1 hex is 1 nibble

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

Because it can be shorter when written.

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

1 byte is like 2 hex digits.

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

It has 4 numbers close to each other, like for example, 192.21.192.19 like this A.B.C.D

And each number can only have a number from 0 to 255 because the highest number for 2 is 2^8 that fits in 8 bits.

so 4 numbers x 8 bits = 32 bit

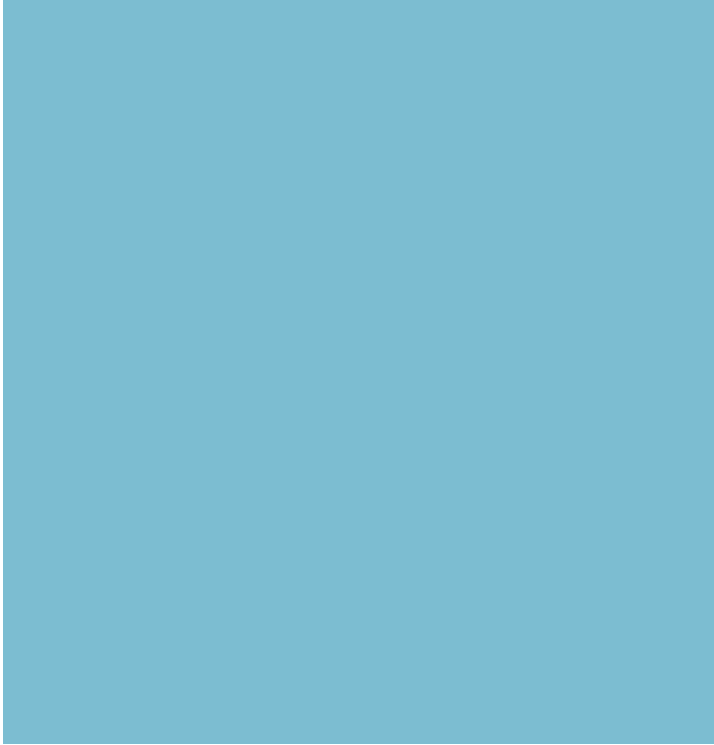
Assignment 1.2: Your favourite color

Hexadecimal color code:

R G B

7c.bd.d1

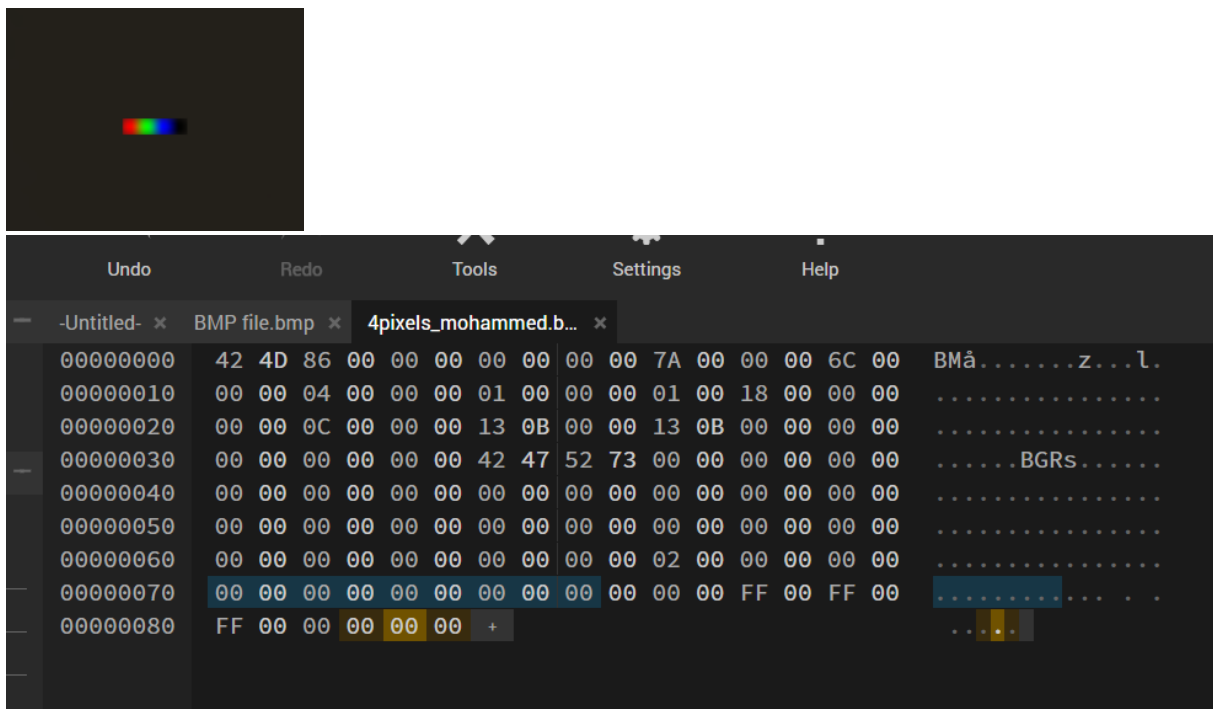
124.189.209



Assignment 1.3: Manipulating binary data

Color	Color code hexadecimal (RGB)	Big Endian	Little Endian
RED	Ff0000	Ff0000	0000ff
GREEN	00ff00	00ff00	00ff00
BLUE	0000ff	0000ff	Ff0000
WHITE	ffffff	ffffff	ffffff
Favourite (previous assignment)	7cbdd1	7cbdd1	D1bd7c

Screenshot modified BMP file in hex editor:



Assignment 1.4: Student number to HEX and Binary

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.

590173

$$590173 / 16 = 36885 \quad D$$

$$36885 / 16 = 2305 \quad 5$$

$$2305 / 16 = 144 \quad 1$$

$$144 / 16 = 9 \quad 0$$

$$9 / 16 = 0 \quad 9$$

HEX 9 015D

$$590173 / 2 = 295086 \quad 1$$

$$295086 / 2 = 147543 \quad 0$$

$$147543 / 2 = 73771 \quad 1$$

$$73771 / 2 = 36885 \quad 1$$

$$36885 / 2 = 18442 \quad 1$$

$$18442 / 2 = 9221 \quad 0$$

$$9221 / 2 = 4610 \quad 1$$

$$4610 / 2 = 2305 \quad 0$$

$$2305 / 2 = 1152 \quad 1$$

$$1152 / 2 = 576 \quad 0$$

$$576 / 2 = 288 \quad 0$$

$$288 / 2 = 144 \quad 0$$

$$144 / 2 = 72 \quad 0$$

$$72 / 2 = 36 \quad 0$$

$$36 / 2 = 18 \quad 0$$

$$18 / 2 = 9 \quad 0$$

$$9 / 2 = 4 \quad 1$$

$$4 / 2 = 2 \quad 0$$

$$2 / 2 = 1 \quad 0$$

$\frac{1}{2} = 0$

1

Binary = 1001 0000 0001 0101 1101

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