Template Week 1 – Bits & Bytes

Student number:

582122

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

A bit is the smallest unit of data in a pc. A byte is 8 bits

What is a nibble?

A nibble is 4 bits.

What relationship does a nibble have with a hexadecimal value?

Because a nibble is 4 bits and while using hexadecimal, we separate the numbers into groups of 4, they overlap perfectly.

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

Showing binary data as hexadecimal is better, because hexadecimal is more compact and readable than binary.

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

A byte has a direct relationship with hexadecimal values because one byte, that is 8 bits, can be exactly represented by two hexadecimal digits.

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

Because it is separated into 4 octets of 4 bytes = 32 bits.

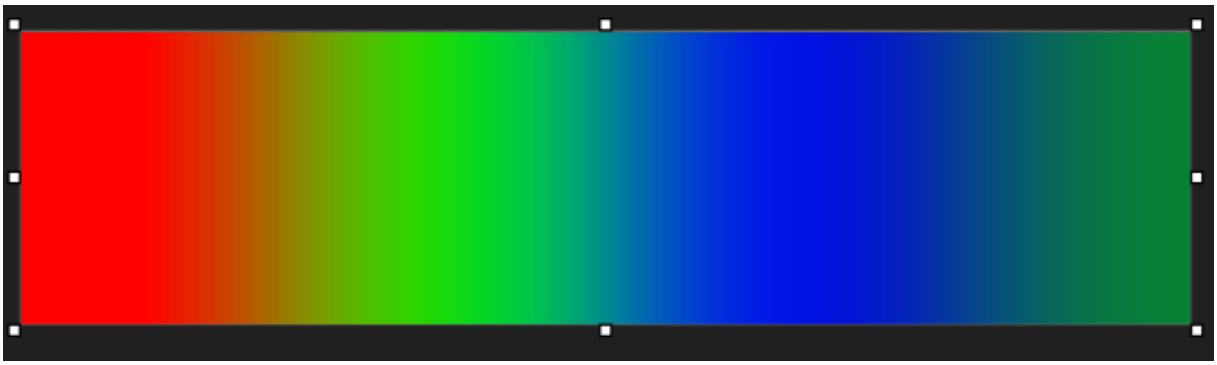
Assignment 1.2: Your favourite color

Hexadecimal color code : #086e52

Assignment 1.3: Manipulating binary data

Color	Color code hexadecimaal (RGB)	Big Endian	Little Endian
RED	#ff0000	#ff0000	#ff0000
GREEN	#00ff00	#00ff00	#00ff00
BLUE	#0000ff	#0000ff	#0000ff
WHITE	#ffffff	#ffffff	#ffffff
Favourite (previous assignment)	#086e52	#086e52	#526e08

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.

My student number:

582122÷16=36382 remainder 10 (which is A)

36382÷16=2273 remainder 14 (E)

2273÷16=142 remainder 1

142÷16=8 remainder 14 (E)

8÷16=0 remainder 8

582122^10=8E1EA16

And to binary: 58212210=10001110000111101010^2