

Template Week 1 – Bits & Bytes

Student number: 575798

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

A bit is the smallest possible unit of data in a computer. One bit holds a value of either 0 or 1. A byte is a group of 8 bits,

What is a nibble?

A nibble is 4 bits.

What relationship does a nibble have with a hexadecimal value?

In binary and hexadecimal systems, a nibble can represent a single digit. Since hexadecimal numbers range from 0 to F.

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

Easier for humans to read and helps us make less mistakes.

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

A byte can be represented with 2 digits in hexadecimal.

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

$4 \times 8 = 32$ bits its structured as four 8-bit segments.

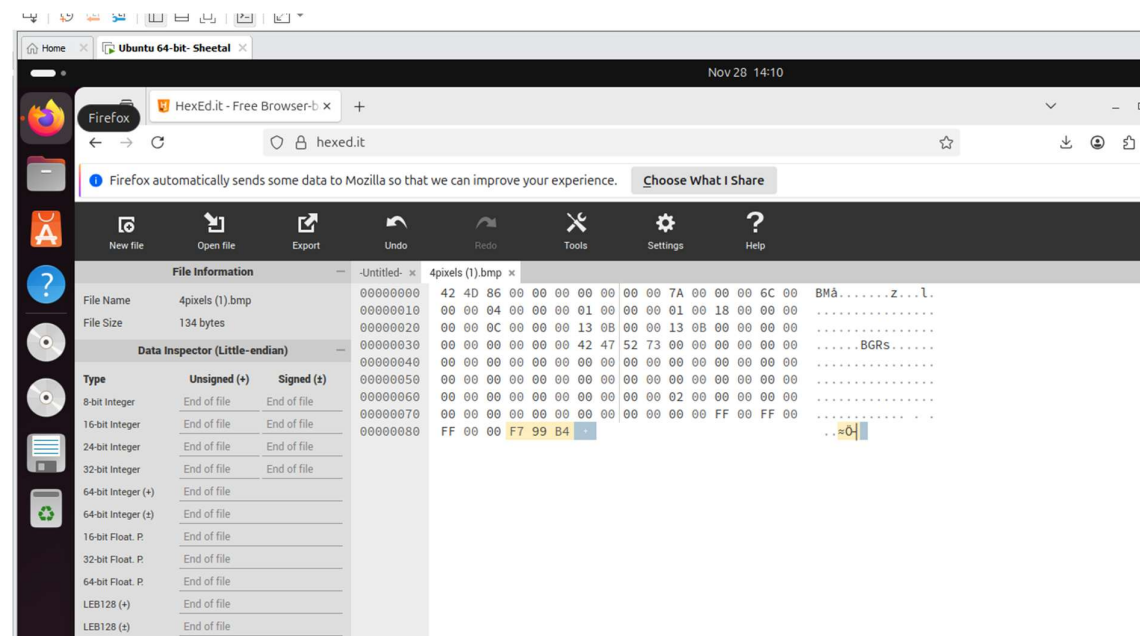
Assignment 1.2: Your favourite colour

Hexadecimal colour code: #b499f7

Assignment 1.3: Manipulating binary data

Color	Color code hexadecimal (RGB)	Big Endian	Little Endian
RED	FF0000	FF 00 00	00 00 FF
GREEN	00FF00	00 FF 00	00 FF 00
BLUE	0000FF	00 00 FF	FF 00 00
WHITE	FFFFFF	FF FF FF	FF FF FF
Favourite (previous assignment)	B499F7	B4 99 F7	F7 99 B4

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.

575798 is my student number.

$$575798/16 = 35,987 \text{ r } 6$$

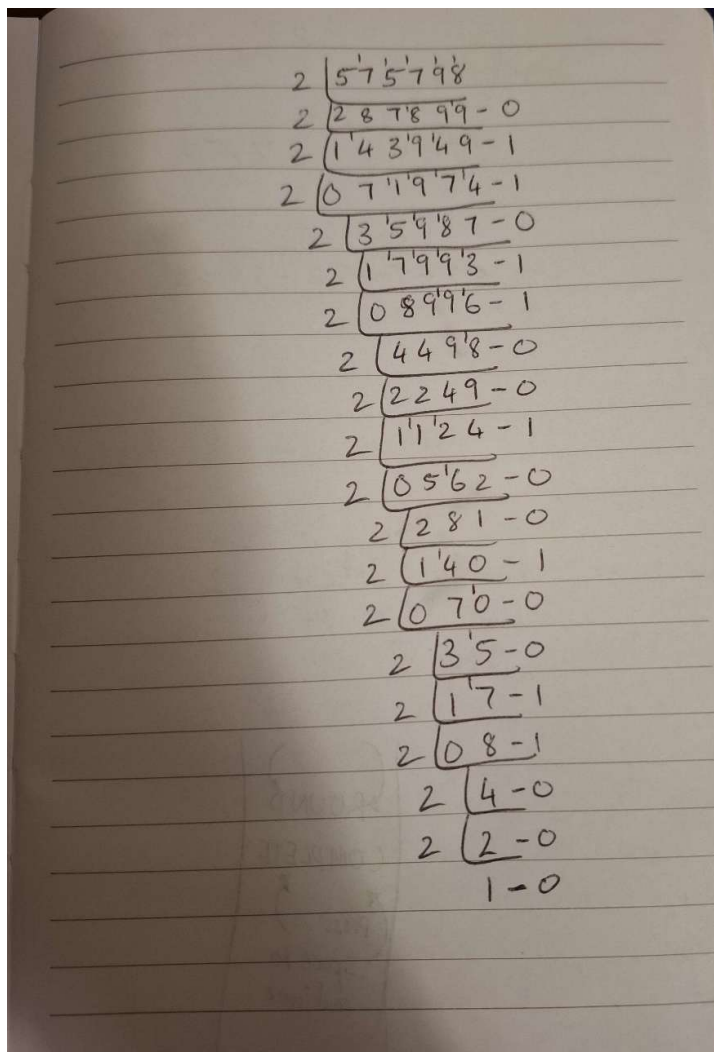
$$35,987/16 = 2,249 \text{ r } 3$$

$$2,249/16 = 140 \text{ r } 9$$

$$140/16 = 8 \text{ r } 12 = C$$

$$8/16 = 0 \text{ r } 8$$

Therefore, in hexadecimal my student number would be 8C936.



Therefore, the binary number would be 10001100100100110110.

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