Template Week 1 – Bits & Bytes

Student number:

545676

Assignment 1.1: Bits & Bytes intro

What are Bits & Bytes?

Bit is the smallest data unit which can be 0 or 1. Byte has 8 bits which can have 256 different values.

What is a nibble?

Group of 4 bits is called nibble.

What relationship does a nibble have with a hexadecimal value?

Nibble has 16 possibilities and can be shown with hexadecimal digits.

0 1 2 3 4 5 6 7 8 9 A B C D E F are all values possible.

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

Because it is easy to read and convert.

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

2 hexadecimal digits show 1 byte.

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

Each decimal value shows 8 bits. 4 x 8 = 32 bits

Assignment 1.2: Your favourite colour

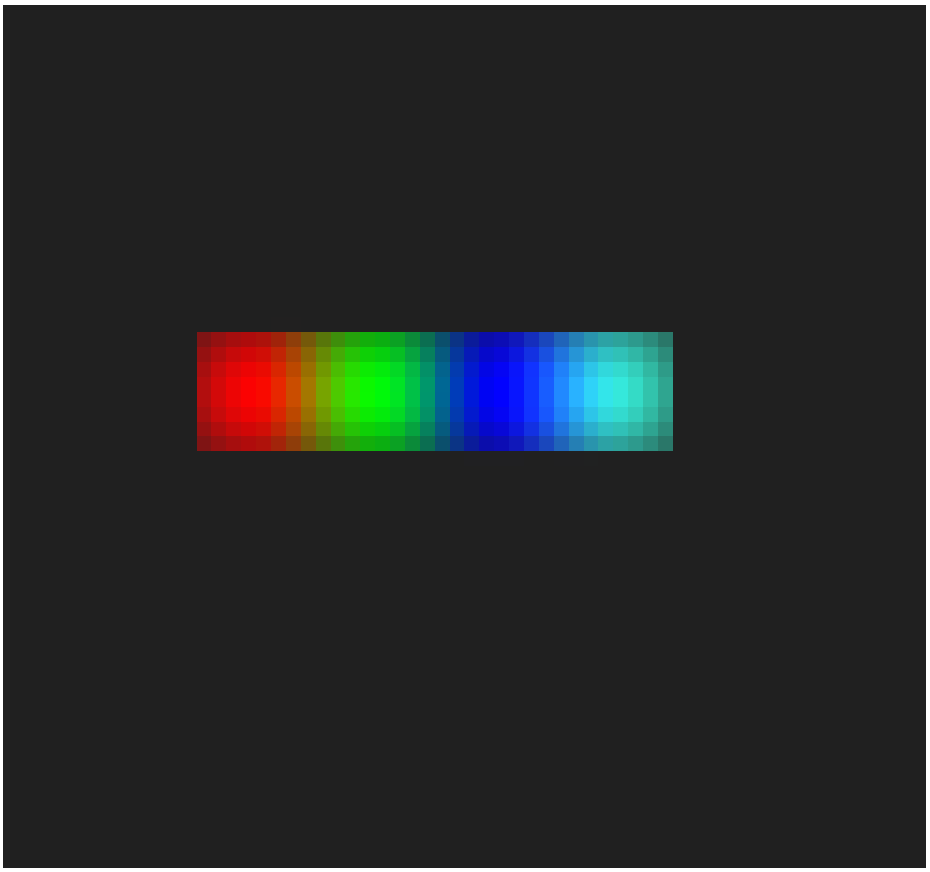
Hexadecimal colour code:

34EBE5

Assignment 1.3: Manipulating binary data

Colour	Colour code hexadecimaal (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)	34EBE5	34 EB E5	E5 EB 34

Screenshot modified BMP file in hex editor:



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.

545676 ÷ 2 = 272838, remainder **0** **10000101011100101100**

272838 ÷ 2 = 136419, remainder **0**

136419 ÷ 2 = 68209, remainder **1**

68209 ÷ 2 = 34104, remainder **1**

34104 ÷ 2 = 17052, remainder **0**

17052 ÷ 2 = 8526, remainder **0**

8526 ÷ 2 = 4263, remainder **0**

4263 ÷ 2 = 2131, remainder **1**

2131 ÷ 2 = 1065, remainder **1**

1065 ÷ 2 = 532, remainder **1**

532 ÷ 2 = 266, remainder **0**

266 ÷ 2 = 133, remainder **0**

133 ÷ 2 = 66, remainder **1**

66 ÷ 2 = 33, remainder **0**

33 ÷ 2 = 16, remainder **1**

16 ÷ 2 = 8, remainder **0**

8 ÷ 2 = 4, remainder **0**

4 ÷ 2 = 2, remainder **0**

2 ÷ 2 = 1, remainder **0**

1 ÷ 2 = 0, remainder **1**

Ready? Save this file and export it as a pdf file with the name: **week1.pdf**