COMPUTER SYSTEMS FUNDAMENTALS
(4COSC004W)

Images Part 3 of 3

In this lecture we will cover:

- Images
  - *24 bit colour RGB*
  - *Pixels*
  - *Sizes of images*

IMAGES

24-bit Bitmap RGB

By the end of this unit you will:

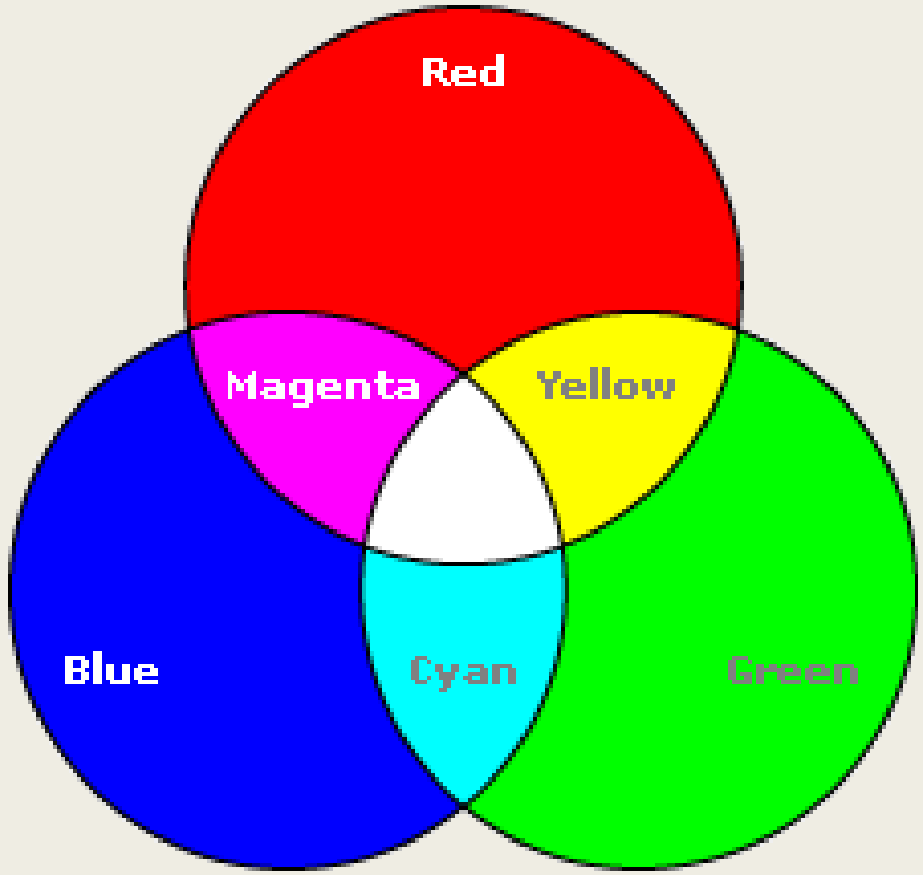
- Understand 24-bit Bitmap RGB colour coding
- Be able to calculate the size of bitmap images

Representing Images and Graphics

- Bitmap
- Vector Graphics

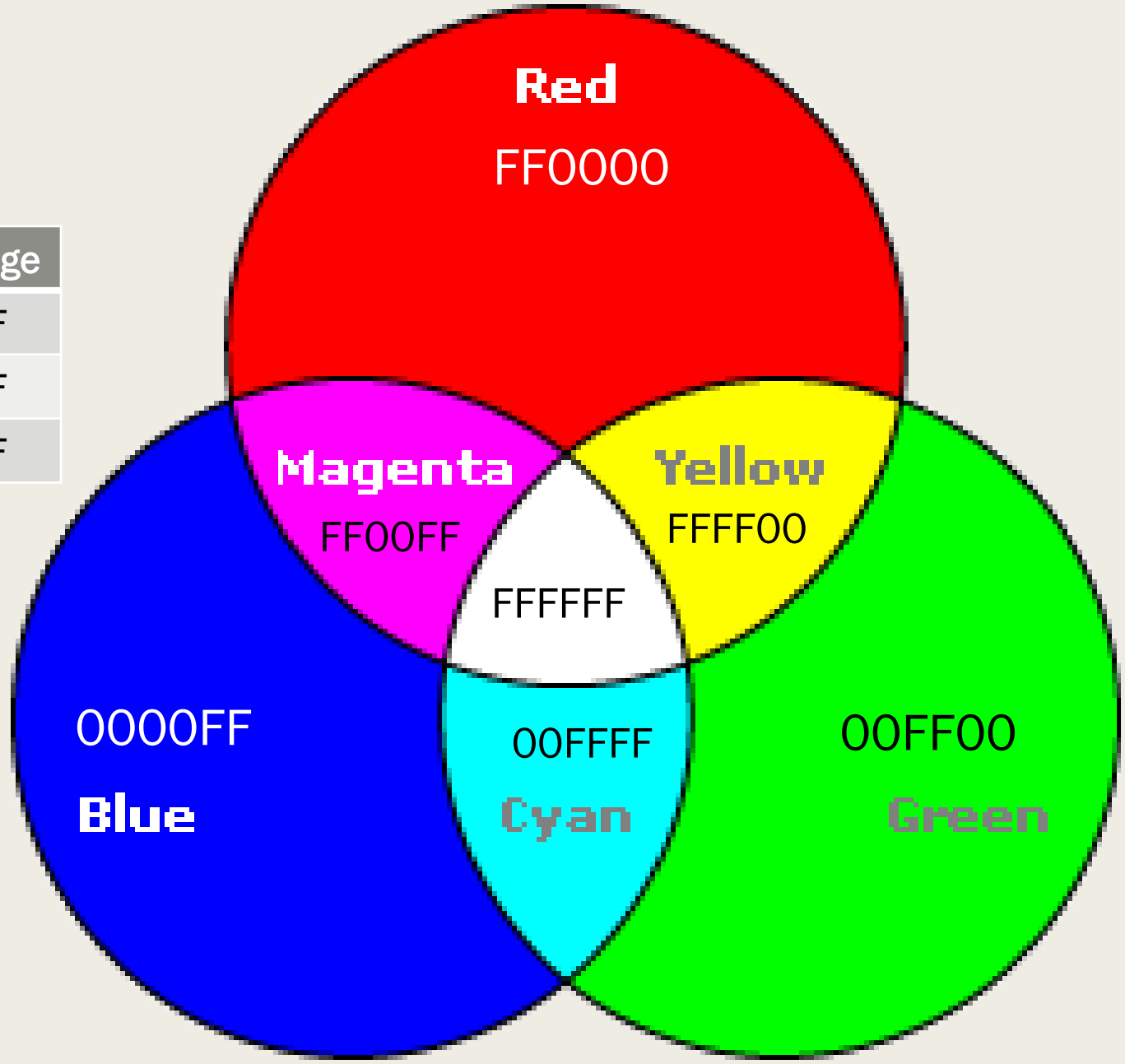
Bitmap - RGB

- 24-Bit colour for each pixel
  - *8 Bits for RED*
  - *8 Bits for GREEN*
  - *8 Bits for BLUE*

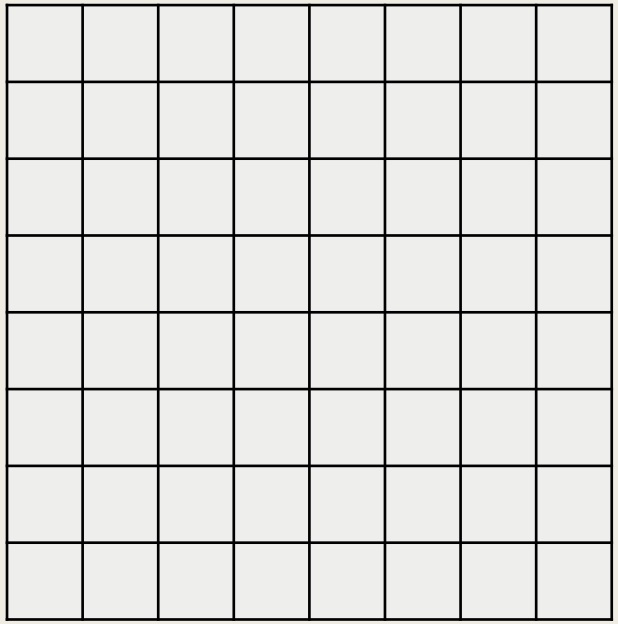


RGB – 24 bit

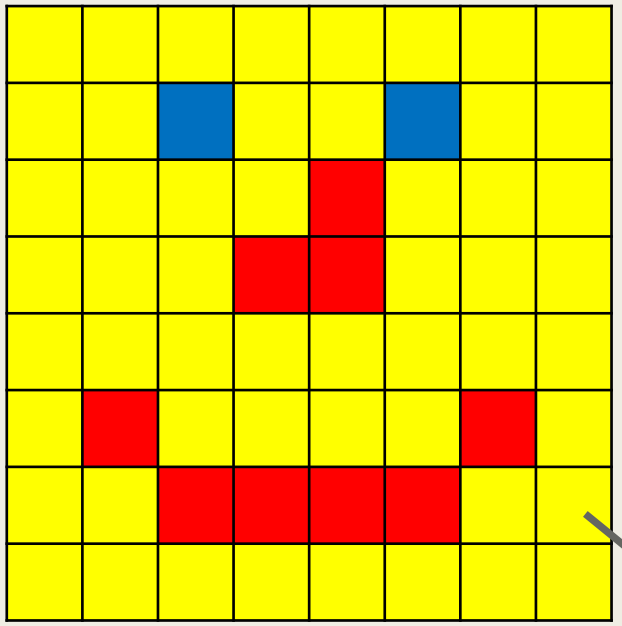
Primary colour	Decimal range	Hex range
Red	0-255	00-FF
Green	0-255	00-FF
Blue	0-255	00-FF



Anatomy of an RGB Bitmap image: 8-by-8 pixel image



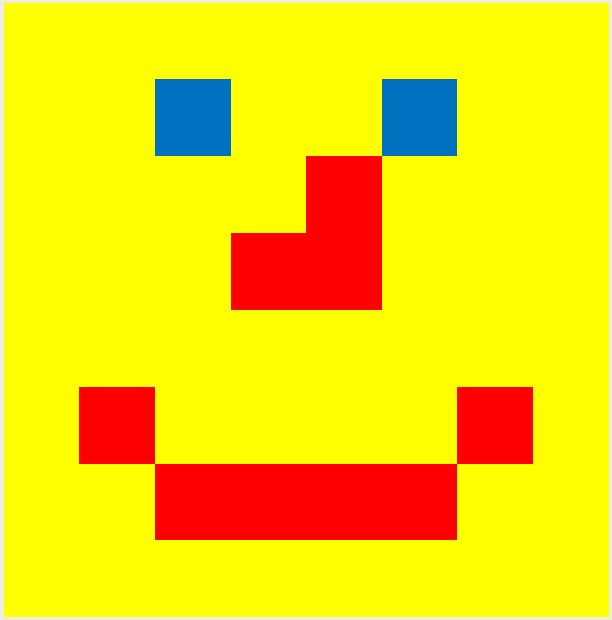
Anatomy of an RGB Bitmap image: 8-by-8 pixel image



Colour:	Red	Green	Blue
Blue	00	00	FF
Red	FF	00	00
Yellow	FF	FF	00

Pixel

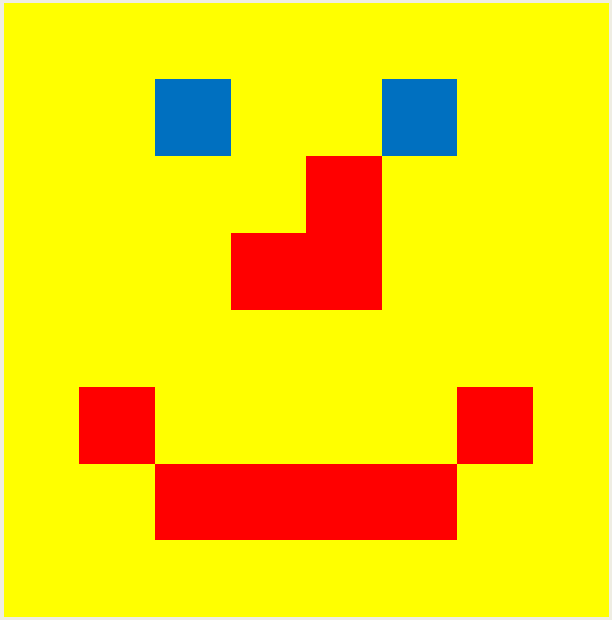
Anatomy of an RGB Bitmap image: 8-by-8 pixel image



FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	0000FF	FFFF00	FFFF00	0000FF	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FF0000	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FF0000	FF0000	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
FFFF00	FF0000	FFFF00	FFFF00	FFFF00	FFFF00	FF0000	FFFF00
FFFF00	FFFF00	FF0000	FF0000	FF0000	FF0000	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00

Pixel

Anatomy of an RGB Bitmap image: 8-by-8 pixel image



FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	0000FF	FFFF00	FFFF00	0000FF	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FF0000	FFFF00	FFFF00	FFFF00
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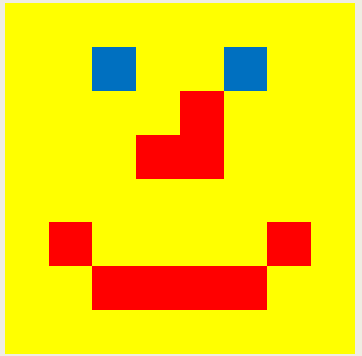
FFFF00	FFFF00	FF0000	FF0000	FF0000	FF0000	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00

64 Pixels

Anatomy of an RGB Bitmap image: 8-by-8 pixel image



- 8 x 8 pixels or 64 pixels
- Each pixel encoded in 3 Bytes
- $64 \times 3 = 192\ Bytes$

FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	0000FF	FFFF00	FFFF00	0000FF	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FF0000	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FF0000	FF0000	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
FFFF00	FF0000	FFFF00	FFFF00	FFFF00	FFFF00	FF0000	FFFF00
FFFF00	FFFF00	FF0000	FF0000	FF0000	FF0000	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00

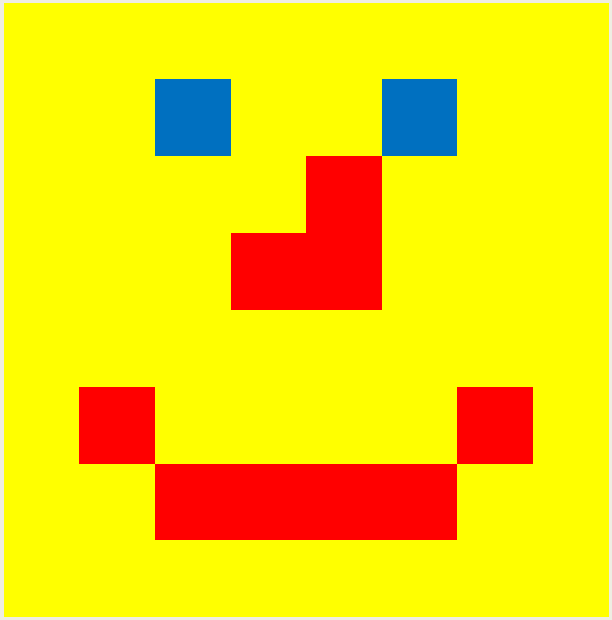
Sizes of Images

- An image which is 1024 by 768 pixels
  - $1024 \times 768 = 786432$ *pixels*
- Each pixel is coded with 3 Bytes of information

- Size of file: $786432 \times 3 = 2359296\ Bytes$
  - $\frac{2359296\ B}{1024} = 2034\ KB$
  - $\frac{2034\ KB}{1024} = 2.25\ MB$

- A 660 MB CD-ROM would be able to store $\frac{660}{2.25} \approx 293$ such images

Image compression



FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
FFFF00	FFFF00	0000FF	FFFF00	FFFF00	0000FF	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FF0000	FFFF00	FFFF00	FFFF00
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FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00
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FFFF00	FFFF00	FF0000	FF0000	FF0000	FF0000	FFFF00	FFFF00
FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00	FFFF00

Pixel

Image compression:

- Adjacent pixels may be the same (or similar) colour.
- There may be a finite colour palate in the image.

In this lecture we looked at:

- Images
  - *24 bit colour RGB*
  - *Pixels*
  - *Sizes of images*

Thank you