COMP SCI
TEST WEEK 2 PREP

Topics to Review:
1. Multimedia (Files, encoding, compression)
2. Computers and their components (Input / Output, Storage)
3. Logic Gates
4. CPU Architecture (Fetch - Execute, registers, interrupts)
5. Assembly Language
6. DB

MULTIMEDIA

- Bitmap Images
- Vector Images → How they're stored, How they compare against each other
- Graphics Software → Common Features
- Sound Files → How they're stored, effects of varying sample resolution and sample rate, calculating sound file size

BITMAP IMAGES

- Bitmap images are made up of a matrix of pixels, and it is stored digitally as a series of binary numbers representing the color values of individual pixels

- The dimensions of the image in terms of pixels, ie the dimensions of the pixel matrix, are stored in the file header of the bitmap image file

- Each pixel in a bitmap image has a certain color value
  ↳ The number of possible color values that a pixel can have varies depends on the number of bits available to represent each pixel

The number of bits available to represent the color of each pixel is called the bit depth

The number of possible color values that a pixel can have is called the colour depth.

$2^{\text{bit depth}} = \text{color depth}$

ie. $2^{8\text{ bits}} = \text{color depth of } 256$

- Standard color requires 8 bits per pixel (256 colour depth)
- True color (RGB) requires 3 bytes or 24 bits per pixel (2^{24} color depth)
- Black and white (or 2-color) images require 2 bits per pixel ($2^1 = 2$ color depth)

Calculating / Estimate image size:

Image size in bits = height in pixels x width in pixels x bit depth

VECTOR GRAPHICS

Vector graphics consist of 2D points connected by (grouped) geometric shapes defined by certain mathematical formulae and attributes defined in the drawing list.
↳ included in the file header

Vector images can be created using computer aided design (CAD) software.

File Header:
- Contains the metadata of the file
- For a vector graphic, the file header contains the drawing list, which contains the following:

1. The commands used to create each geometric shape that makes up the image
2. The attributes of each shape. Things such as border width, border color, fill colour, etc.
3. The relative position of each geometric object
4. Relative dimensions are defined, allowing the scaling of the vector graphic / groups of geometric shapes, without any loss in image quality

BITMAPS vs. VECTORS

Bitmaps	Vectors
• Made up of geometric shapes of specific attributes	• Made up of individual pixels arranged in a matrix
• To edit, entire geometric shapes are altered	• Individual pixels can be edited

- Do not require large file sizes, since shape is defined by a group of mathematical equations
- Due to being limited to only

- Relatively larger file size, since the color value of each pixel needs to be stored individually.