Section 01.2 - Multimedia - Graphics, Sound

Layer 3: ISA Machine

Syllabus Content Section 01: Information Representation

S01.2.1 Show understanding of how data for a bitmapped image are encoded

Use and understand the terms: pixel, file header, image resolution, screen resolution, colour depth/bit depth

---

`Pixel`: the smallest picture element which can be drawn
`Image Resolution`: the amount of pixels per centimeter
`Screen Resolution`: the number of pixels which can be viewed horizontally and vertically on the screen
`Color Depth`: number of bits used to represent the color of a single pixel

S01.2.2 Perform calculations to estimate the file size for a bitmap image

---

File size= Horizontal Pixel × Vertical Pixel × Color Depth (unit: bit)

S01.2.3 Show understanding of the effects of changing elements of a bitmap image on the image quality and file size

Use the terms: image resolution, colour depth/bit depth

`image resolution`: the number of pixels in the bitmap file defined as the product of the width and the height values

`colour/bit depth`: the number of bits used to represent each of the red, green and blue colours

> examles:

A black and whit image with 600×800 resolution
file size=600 × 800 × 1 = 480000bits = 6000bytes = 58.5KB = 0.05MB
A 16bit image with 600×800 resolution
file size=600 × 800 × 16 = 7680000 bits = 960000bytes = 937.5KB = 0.9MB

S01.2.4 Show understanding of how data for a vector graphic are encoded

Use the terms: drawing object, property, drawing list

`Drawing Object`:What you are actually drawing. Circle, Square, Text, Lines etc..
`Property`:The location, size, stroke and colour of the drawing object
`Drawling list`:What to draw in what order (what layers are first)
`User Space`:The area you are drawing in

S01.2.5 Justify the use of a bitmap image or a vector graphic for a given task

---

Bitmap image:

- Made of pixels.
- Lose quality when the image is resized larger.

Vector image:

- Made of shapes.
- More scalable without losing quality.
- More specialized uses.

S01.2.6 Show understanding of how sound is represented and encoded

Use the terms: sampling, sampling rate, sampling resolution, analogue and digital data

---

`Sampling`: amplitude of sound wave taken at different points in time
`Sampling Resolution`: number of bits assigned to each sample
`Sampling Rate`: number of samples taken per unit time
`Bit rate`: number of bits used to store 1 second of sound
`Anaglog signal`: a continuous signal which represents physical measerments(sine waves)
`Digital signal`: discrete time signals generated by digital modulation(square waves)

S01.2.7 Show understanding of the impact of changing the sampling rate and resolution

Impact on file size and accuracy

Using a higher sampling resolution/rate:

- Benefit: allows for larger dynamic range; more accurate representation
- Drawback: bigger files occupies more storage; grater processing power needed