AQA Computer Science A Level

4.5.6 Representing images, sound and other data

Flashcards
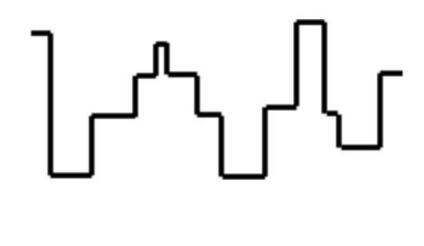
Which type of signal is shown here?

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Digital signal

What two things are true of a cipher that is computationally secure?

What two things are true of a cipher that is computationally secure?

1. The cipher can be cracked
2. But not within a reasonable timeframe given current computing power

What device can be used to convert a signal from analogue to digital?

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An analogue to digital converter (ADC)

What is the most common use for an ADC?

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Converting digital audio signals to analogue signals

What name is given to the process of reading an analogue signal at regular intervals and recording values?

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Sampling

What is the unit for sampling frequency?

What is the unit for sampling frequency?

Hertz (Hz)

State two disadvantages of MIDI

State two disadvantages of MIDI

1. MIDI can't be used for storing speech
2. MIDI sometimes results in a less realistic sound than sampled recordings

What type of data compression is run-length encoding?

What type of data compression is run-length encoding?

Lossless compression

How much storage, in bytes, is required for a 10 × 10 image with a colour depth of 8 bits?

How much storage, in bytes, is required for a 10 × 10 image with a colour depth of 8 bits?

100 Bytes

(10 × 10) × 8 = 800 bits

800 ÷ 8 = 100 bytes

Which type of data is continuous?

Which type of data is continuous?

Analogue data

Give two examples of typical metadata for an image

Give two examples of typical metadata for an image

Examples include width, height, colour depth and date created

Which two criteria must be met by a key if it is to be used in a Vernam cipher?

Which two criteria must be met by a key if it is to be used in a Vernam cipher?

The key must be

1. Random
2. At least as long as the plaintext

Which type of image can be scaled without losing quality?

Which type of image can be scaled without losing quality?

Vector graphics

Which type of Caesar cipher is most easily cracked: shift ciphers or substitution ciphers?

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Shift ciphers

Which rule states that the sampling rate must be at least twice the frequency of the signal?

Which rule states that the sampling rate must be at least twice the frequency of the signal?

The Nyquist Theorem

What does MIDI stand for?

What does MIDI stand for?

Musical Instrument Digital Interface

Name two types of data compression

Name two types of data compression

1. Lossy compression
2. Lossless compression

How does MIDI store sound?

How does MIDI store sound?

Using a series of event messages

Which type of image is used for storing photographs?

Which type of image is used for storing photographs?

Bitmapped graphics

With which type of data compression does the quality of a file remain the same?

With which type of data compression does the quality of a file remain the same?

Lossless compression

Which type of cipher encrypts information by replacing characters?

Which type of cipher encrypts information by replacing characters?

Caesar ciphers