# AQA Computer Science GCSE 3.4.5 Systems Architecture

## Flashcards

# What is the purpose of the CPU?

## What is the purpose of the CPU?

The Central Processing Unit executes instructions in order to run programs.

# What does the Arithmetic Logic Unit do?

# What does the Arithmetic Logic Unit do?

Performs mathematical calculations and logical operations as required.

# What does the Control Unit do?

# What does the Control Unit do?

Marshals and controls the operation of the fetch-decode-execute cycle, synchronising the operation of the CPU and sending commands to components.

# What does the clock do?

## What does the clock do?

Sends a regular electrical signal which changes at a regular frequency. This signal is used to synchronise the computer system's components.

# What are registers?

What are registers?

Fast-to-access storage locations, used to store small amounts of data needed temporarily by the CPU during processing.

# What is a bus?

# What is a bus?

A collection of wires through which data/signals are transmitted from one component to another.

# What is clock speed?

## What is clock speed?

The number of FDE cycles the CPU can perform per unit time. Measured in hertz.

# How does increasing cache size improve performance?

It increases the likelihood that a required instruction will be in the cache, reducing memory access time.

# What is the benefit of having multiple CPU cores?

# What is the benefit of having multiple CPU cores?

More cores enable the CPU to handle multiple tasks concurrently, making it faster.

# What are the three stages of the fetch-decode-execute cycle?

What are the three stages of the fetch-decode-execute cycle?

Fetch, Decode, Execute

# What happens in the "fetch" stage?

What happens in the "fetch" stage?

The next instruction is fetched from memory to the CPU.

# What happens in the "decode" stage?

What happens in the "decode" stage?

The CPU interprets the fetched instruction to determine what operation needs to be performed.

# What happens in the "execute" stage?

What happens in the "execute" stage?

The instruction is carried out. Data required by the instruction may be fetched from, or stored to, the main memory.

# What is Von Neumann architecture?

# What is Von Neumann architecture?

A system where instructions and data share the same memory and bus.

# What does it mean for memory to be volatile?

What does it mean for memory to be volatile?

Its contents are lost when the computer loses power.

# What is stored in the Random Access Memory (RAM)?

## What is stored in the Random Access Memory (RAM)?

The data and instructions that the computer is currently working with.

# Is the Random Access Memory (RAM) volatile or non-volatile?

# Is the Random Access Memory (RAM) volatile or non-volatile?

Volatile

# What is stored in the Read-Only Memory (ROM)?

# What is stored in the Read-Only Memory (ROM)?

Firmware that is essential for the computer to boot up and operate.

True or false: the ROM's contents can be modified during normal operation

# True or false: the ROM's contents can be modified during normal operation

False

Is the Read-Only Memory (ROM) volatile or non-volatile?

# Is the Read-Only Memory (ROM) volatile or non-volatile?

Non-volatile

# What is stored in the cache?

# What is stored in the cache?

Frequently used data/instructions

# What is stored in the registers?

What is stored in the registers?

Data needed by the CPU during processing, such as the current instruction being decoded

# What does main memory encompass?

## What does main memory encompass?

All memory directly accessible by the CPU, excluding cache and registers.

# What does secondary storage encompass?

# What does secondary storage encompass?

Any non-volatile storage mechanism not directly accessible by the CPU.

# Name three types of secondary storage

# Name three types of secondary storage

Solid-state, optical and magnetic

Which type of secondary storage uses electrical circuits to persistently store data?

# Which type of secondary storage uses electrical circuits to persistently store data?

Solid-state

# How is information read from an optical disk?

How is information read from an optical disk?

By shining a laser at the disk, and measuring the intensity of the reflected light.

# How is information written to an optical disk?

How is information written to an optical disk?

Pits are burnt into the disk by a high-power laser which permanently deforms the surface.

What do pits and lands represent in terms of binary?

The continuation of a land/pit reflects light (representing a 0) whereas a transition between a land and a pit scatters light (representing a 1).

How is binary data represented using the magnetic storage medium?

How is binary data represented using the magnetic storage medium?

By tiny magnetised regions, where the magnetic orientation in one direction represents 0, and the other direction represents 1.

# What are tracks and sectors on a magnetic hard disk?

## What are tracks and sectors on a magnetic hard disk?

Data is written in concentric tracks, each of which is further divided into sectors.

How is data read from a magnetic hard disk?

# How is data read from a magnetic hard disk?

The read/write head is moved to be over the correct track, and the disk spins round. A whole sector is read in one go by the read/write head.

# What is cloud storage?

## What is cloud storage?

Where users store their files in a remote location, where magnetic and/or solid state storage is used to store their files on their behalf.

Explain three advantages of cloud storage compared with local storage.

# Explain three advantages of cloud storage compared with local storage.

- Enables users to access their data from more places and devices
- Parts of cloud storage can be made publicly available to others, enabling users to share their data more easily
- The cost of computing devices can be made cheaper to users as there is no need for as much built-in secondary storage

Explain three disadvantages of cloud storage compared with local storage.

# Explain three disadvantages of cloud storage compared with local storage.

- Cloud storage could potentially cost more in the long-term, as costs are typically ongoing
- There are potential data privacy issues, as there is an increased chance of others accessing personal data
- Relies on access to high-bandwidth network connection

# What is an embedded system?

What is an embedded system?

A computer system that is designed to perform specific, dedicated functions within a larger mechanical or electronic system.

Give three examples of what embedded systems could do inside a washing machine.

Give three examples of what embedded systems could do inside a washing machine.

Control water temperature, cycle timing and motor speed