OCR Computer Science GCSE
1.1 - 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 (ALU) do?

What does the Arithmetic Logic Unit (ALU) do?

Performs mathematical calculations and logical operations as required.

What does the Control Unit (CU) do?

What does the Control Unit (CU) do?

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

What is cache?

What is cache?

A small, fast memory device located on the CPU that stores frequently used data and instructions.

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 the function of the MAR (Memory Address Register)?

What is the function of the MAR (Memory Address Register)?

Stores the address of the data to be fetched from or the address where the data is to be stored.

What is the function of the MDR (Memory Data Register)?

What is the function of the MDR (Memory Data Register)?

Stores the data that is being fetched from or written to memory.

What is the function of the Program counter?

What is the function of the Program counter?

Stores the address of the next instruction to be fetched from memory. Increments during each fetch-execute cycle.

What is the function of the accumulator?

What is the function of the accumulator?

Stores the results of calculations or operations carried out by the Arithmetic Logic Unit (ALU). Also temporarily holds data being processed.

Give the stages of the fetch-execute cycle.

Give the stages of the fetch-execute cycle.

- The address of the next instruction to be fetched is transferred from the Program Counter to the Memory Address Register (MAR)
- The instruction is fetched from memory and copied into the Memory Data Register (MDR)
- The Program Counter is incremented
- The instruction is decoded by the Control Unit (CU)
- The decoded instruction is then executed by the CPU or ALU
- The process repeats for the next instruction so that the CPU performs continuously

What is Von Neumann architecture?

What is Von Neumann architecture?

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

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 is clock speed?

What is clock speed?

The number of fetch-execute cycles the CPU can perform per unit time (measured in hertz).

How does increasing cache size improve performance?

How does increasing cache size improve performance?

It increases the likelihood that a given 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 simultaneously, making it faster.

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.