CAIE Computer Science IGCSE

3.1 Computer architecture

Flashcards

What is the purpose of the CPU?

What is the purpose of the CPU?

The Central Processing Unit processes instructions and data that are input into the computer so that the result can be output.

What is a microprocessor?

What is a microprocessor?

A type of integrated circuit that contains the CPU (and sometimes other components) on a single chip.

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 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 CIR (Current Instruction Register)?

What is the function of the CIR (Current Instruction Register)?

Stores the instruction (passed from the MDR) that is being decoded by the CU or executed by the CPU.

What is the function of the Program counter (PC)?

What is the function of the Program counter (PC)?

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

What is the function of the accumulator (ACC)?

What is the function of the accumulator (ACC)?

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

What is a bus?

What is a bus?

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

What does the address bus do?

What does the address bus do?

Carries memory addresses from the CPU to other components, like RAM or input/output devices.

What does the data bus do?

What does the data bus do?

Transmits the actual data or instructions between the CPU and other components.

What does the control bus do?

What does the control bus do?

Sends control signals and timing information between the CPU and other components.

What does it mean for a bus to be unidirectional?

What does it mean for a bus to be unidirectional?

Data only flows from the CPU to other components.

What does it mean for a bus to be bidirectional?

What does it mean for a bus to be bidirectional?

Data flows both to and from the CPU to other components.

Name the bidirectional bus(es).

Name the bidirectional bus(es).

Data bus; control bus.

Name the unidirectional bus(es).

Name the unidirectional bus(es).

Address bus.

What is clock speed?

What is clock speed?

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

What is cache?

What is cache?

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

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 a CPU's instruction set?

What is a CPU's instruction set?

A complete list of all the machine code instructions that it can understand and execute.

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.

What might embedded systems do within domestic appliances?

What might embedded systems do within domestic appliances?

Control temperature, timers, spin speed and safety features in devices like washing machines, dishwashers and fridges.