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Day - 16

Embedded Systems Programming

MICROPROCESSOR CLOCK

A **microprocessor** clock is a crucial component of a microprocessor that generates the timing signals needed for the processor to execute instructions and coordinate operations.

The microprocessor clock is an oscillator that produces a continuous square wave signal, typically measured in **Hertz (Hz).**

This clock signal determines **the timing and speed** at which the microprocessor operates, allowing it to synchronize its internal operations and communicate with other components in a computer system.

KEY CHARACTERISTICS

- **Clock Frequency:** Frequency is the number of cycles that occur in one second and is measured in hertz (Hz).

- **For example,** a frequency of 1 Hz means one cycle per second, while 1 MHz (megahertz) means one million cycles per second.

- A **higher clock frequency** means that the microprocessor can perform more cycles per second, leading to faster processing speeds.

KEY CHARACTERISTICS

- **Clock Cycle:** A cycle refers to one complete waveform of a clock signal. During each clock cycle, the microprocessor can execute an instruction, perform calculations, or access memory.

RELATIONSHIP

The relationship between cycle and frequency can be described mathematically:

Frequency (f) = 1 / Cycle Time (T)

Where:

- **Frequency (f)** is measured in **hertz (Hz).**
- **Cycle Time (T)** is the duration of one cycle, measured in seconds.

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