

CPU Performance Evaluation:

CPU performance is evaluated primarily through three related measures: clock speed, instruction count, and CPI (Cycles Per Instruction).

1. **Clock Speed:** Also referred to as the clock rate or clock frequency, it measures the number of cycles that a CPU can perform per second. It's expressed in GHz (gigahertz). For instance, a CPU with a clock speed of 3.0 GHz can perform 3 billion cycles per second.
2. **Instruction Count:** This is the total number of instructions that a program needs to complete its execution. It's largely determined by the program itself, the compiler used to create the program, and the instruction set architecture of the CPU.
3. **CPI (Cycles Per Instruction):** This measures the average number of clock cycles required to execute one machine instruction. It's determined by the CPU's architecture and design.

The combined equation to measure CPU performance with these parameters is:

$$\text{Execution Time} = \text{Instruction Count} * \text{CPI} / \text{Clock Speed}$$