- Every computer contains at least one clock that synchronizes the activities of its components.
- A fixed number of clock cycles are required to carry out each data movement or computational operation.
- The clock frequency, measured in megahertz or gigahertz, determines the speed with which all operations are carried out.
- Clock cycle time is the reciprocal of clock frequency.
    - An 800 MHz clock has a cycle time of 1.25 ns.
    - Question: what is the clock speed of a clock having an 8 ns cycle time.
    - Answer: $f = 1/cycle\ time = 1/8 \times 10^{-9} = 125\ MHz$
- Clock speed should not be confused with CPU performance.
- The CPU time required to run a program is given by the general performance equation:

$$CPU\ Time = \frac{seconds}{program} = \frac{instructions}{program} \times \frac{average\ cycles}{instruction} \times \frac{seconds}{cycle}$$

    - We see that we can improve CPU throughput when we reduce the number of instructions in a program, reduce the number of cycles per instruction, or reduce the number of nanoseconds per clock cycle.