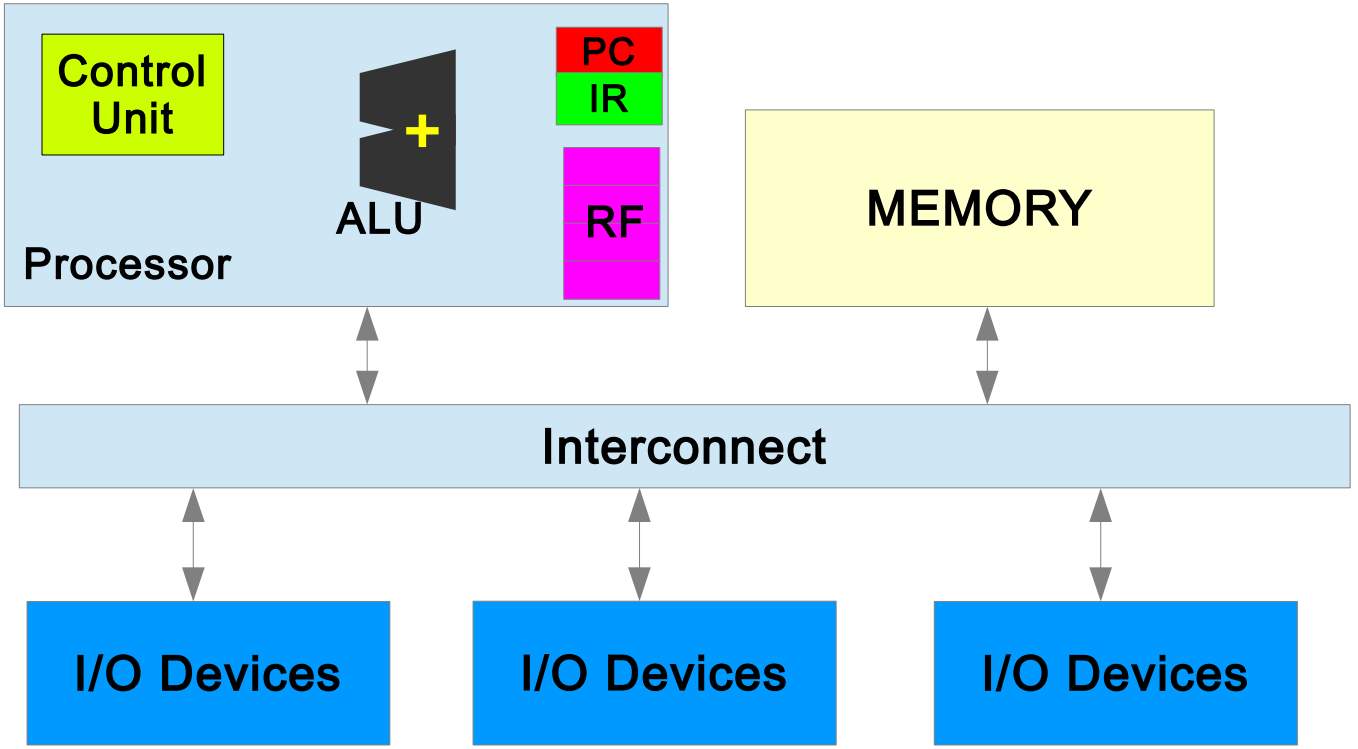
M1 – Computers and Data

Module Outline

- Architecture vs. Organization.
- **Computer system and its submodules.**
- **Concept of frequency.**
- **Processor performance equation.**
- Representation of information – characters, signed and unsigned integers.
  - IEEE 754 floating point standard.

Basic Computer Organization

- Processor – Executes programs
- Main Memory – Holds program and data
- I/O – For communication and data



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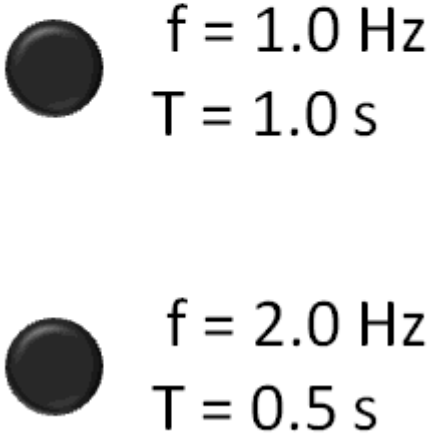

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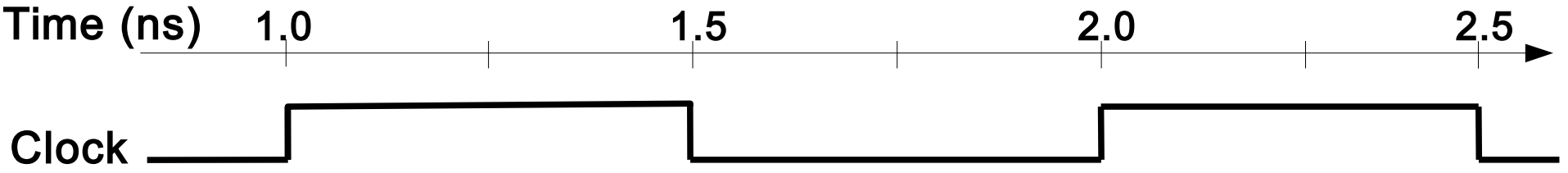

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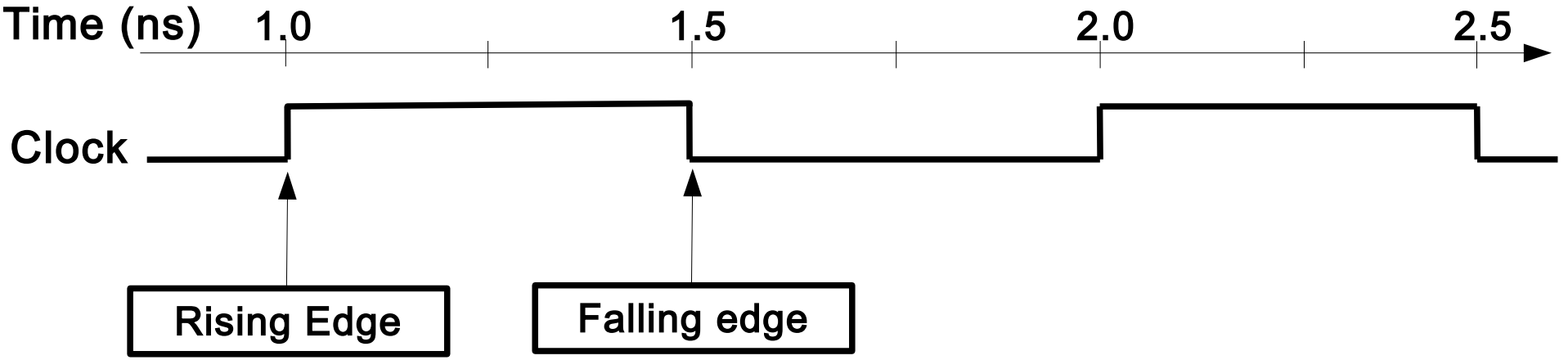

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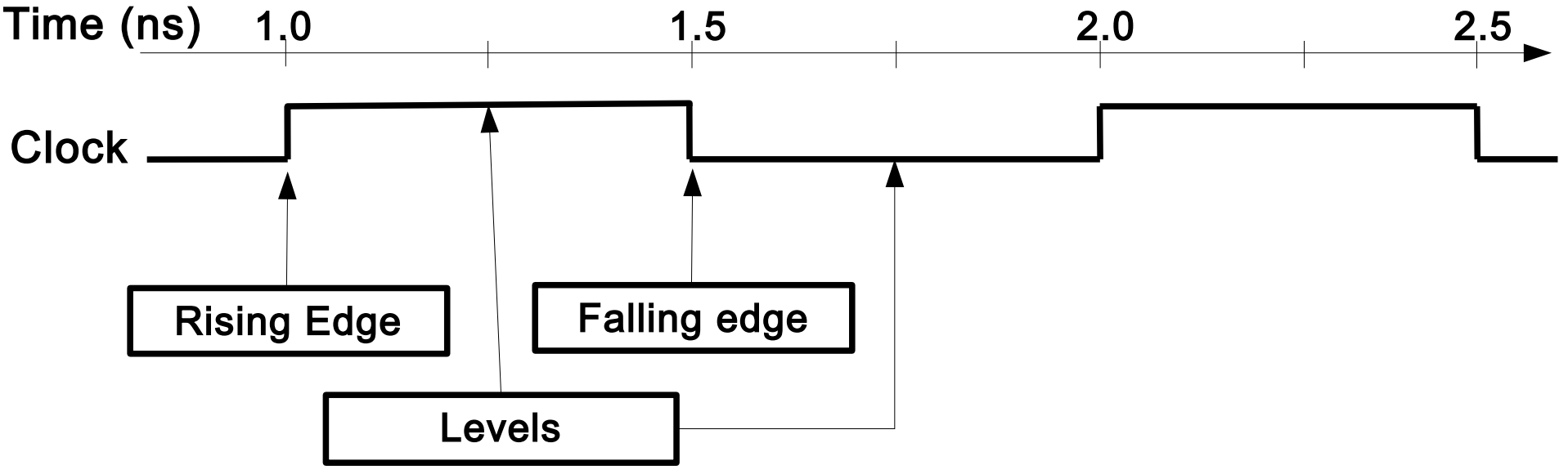

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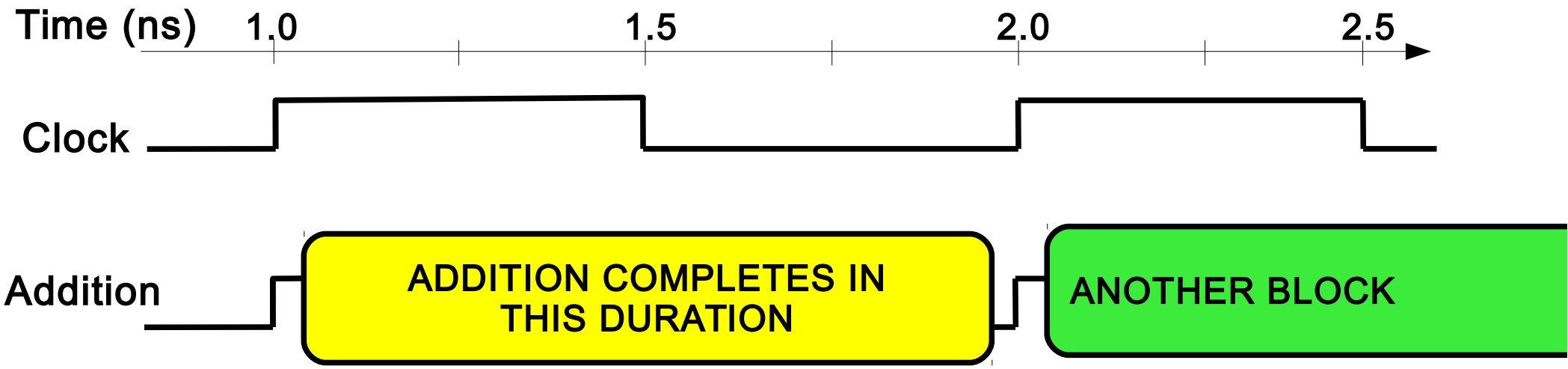

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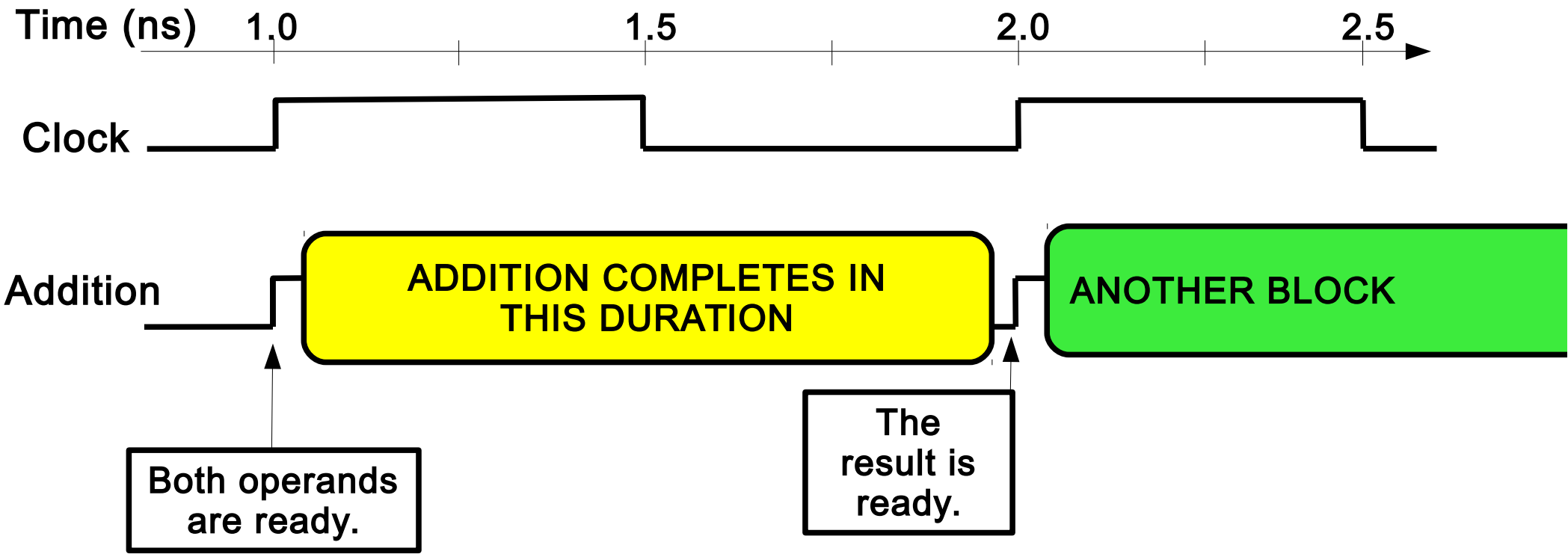

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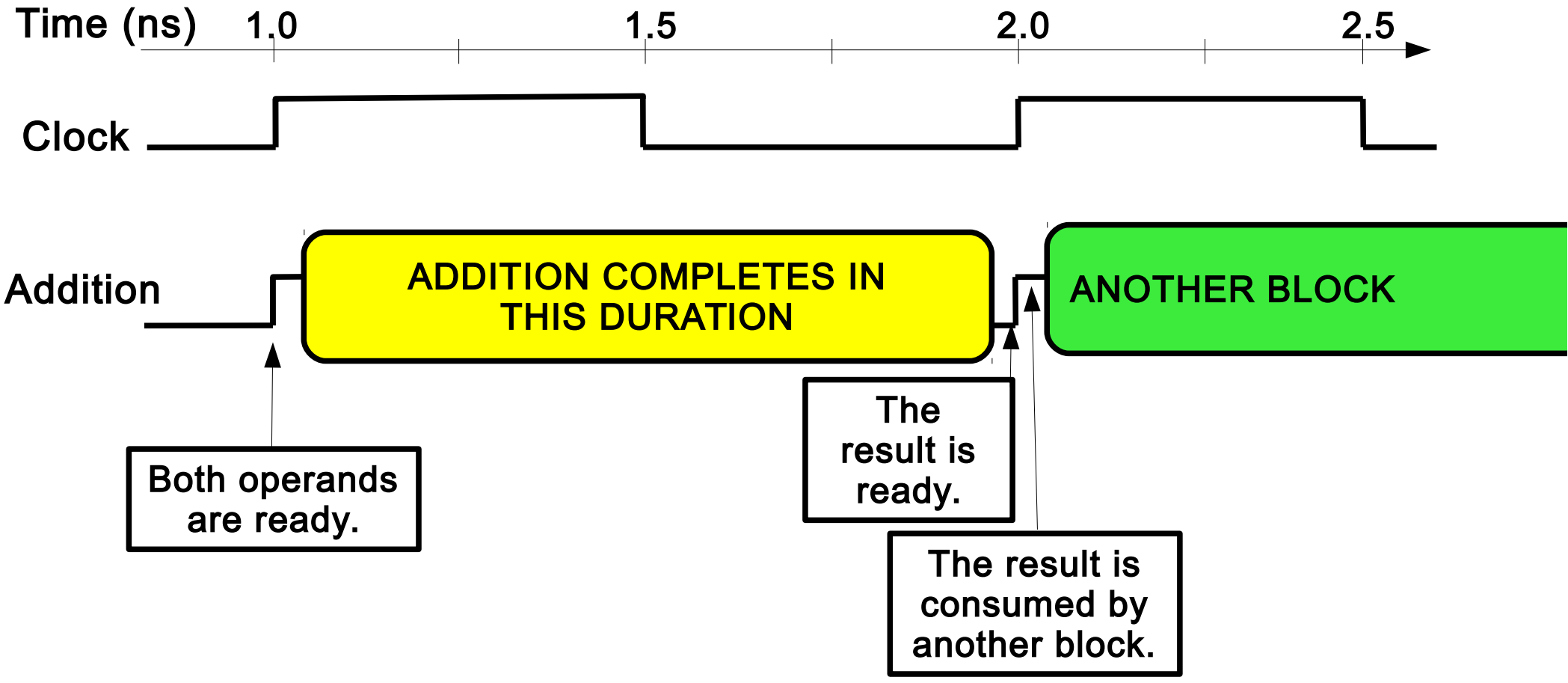

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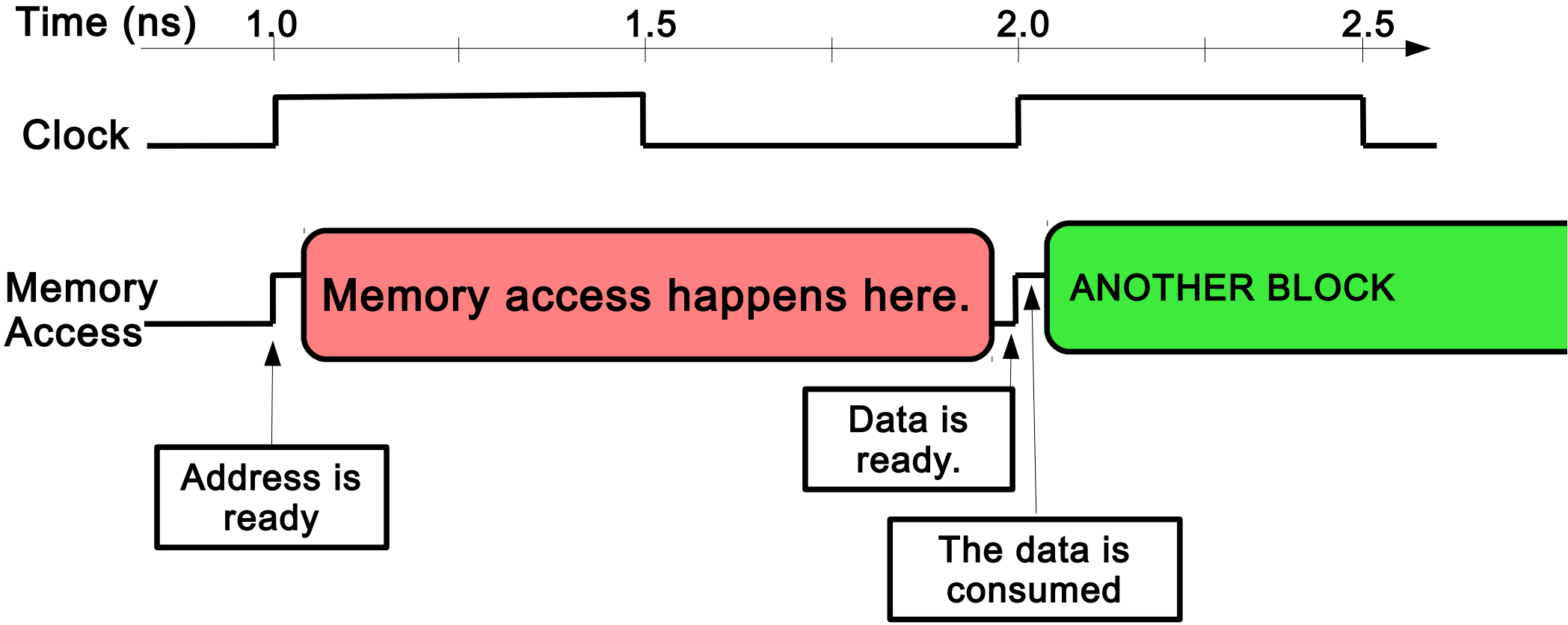

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Example

What is the execution time of a program containing a million instructions each occupying 4 cycles in a 2 GHz processor?

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COMPILER

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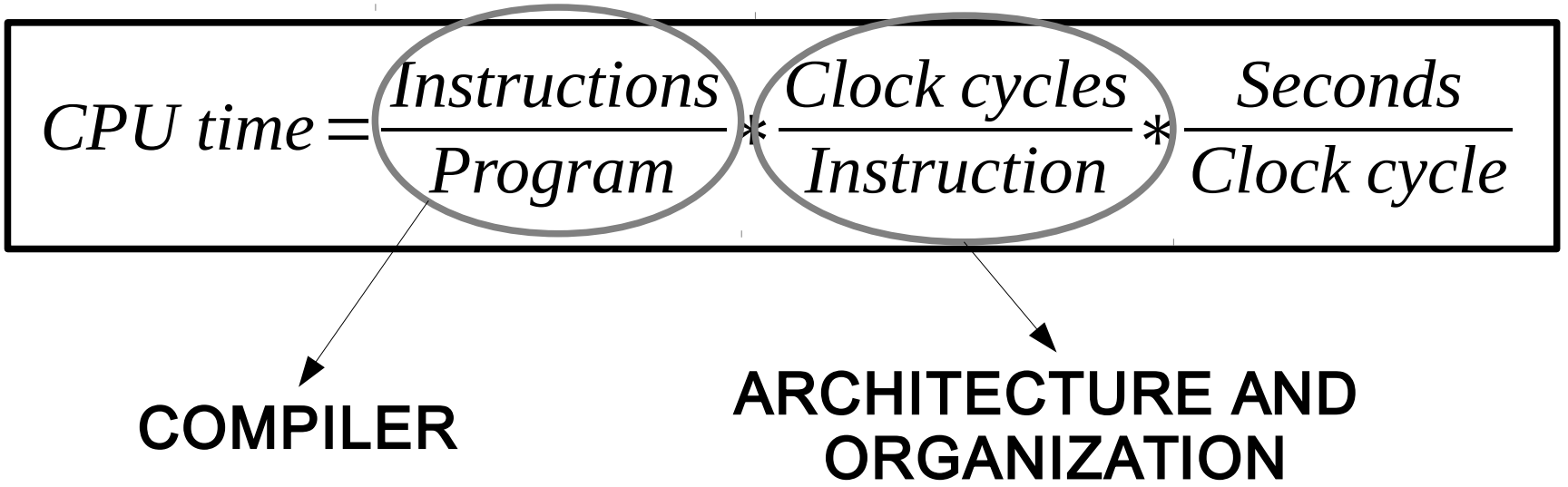

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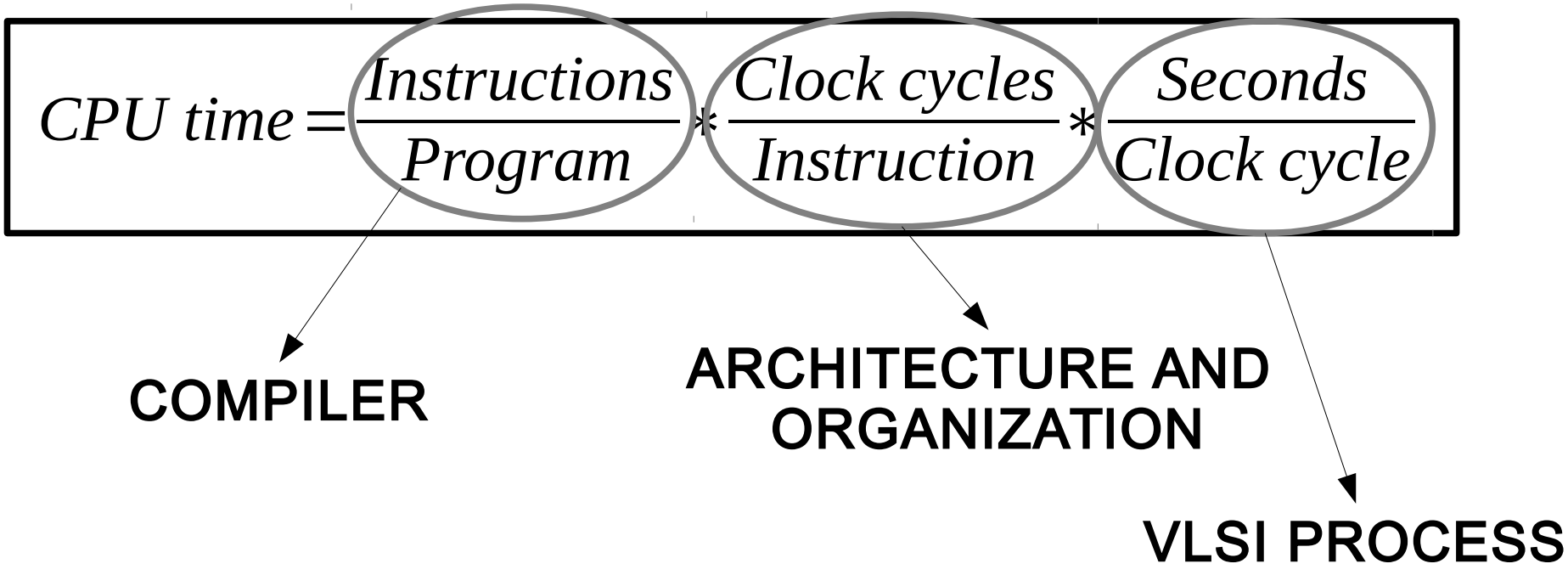

Summary

- Inside the processor, system
- Frequency, Clock cycle
- IPC, CPI
- Iron Law of Processor Performance

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