



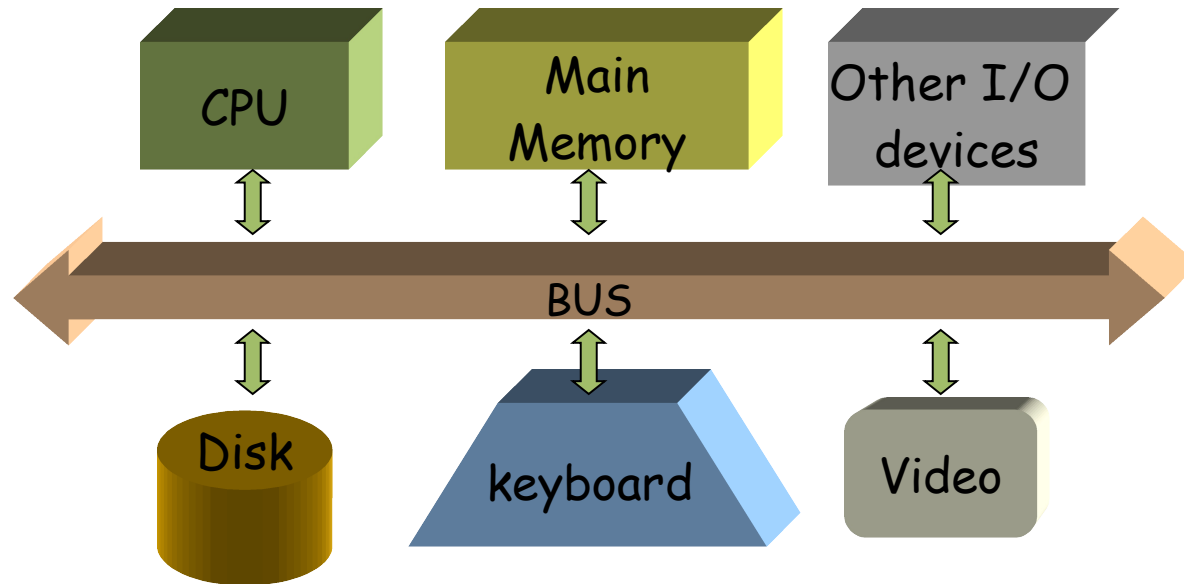
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# The architecture of a PC

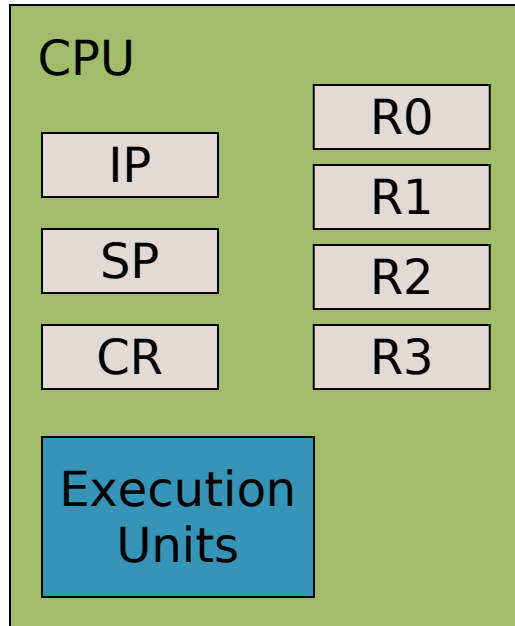
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# Basic blocks





# The processor



- Set of registers
  - IP: instruction pointer
  - SP: stack pointer
  - A0-A3: general registers
  - CR: control register
- Execution units
  - Arithmetic unit
  - Fetching unit
  - Branch prediction unit
  - ...
- Other components
  - Pipeline
  - Cache



## Main Memory and bus

- The RAM
  - Sequence of data locations
  - Contains both instructions (TEXT) and data variables
- The bus
  - A set of “wires”
    - Address wires
    - Data wires
  - The number of data wires is the amount of bits that can be read with one memory access
    - Current PC buses: 32 bits, 64 bits



# Memory



# Instruction execution

- We distinguish at least two phases
  - Fetching: the instruction is read from memory
  - Execute: the instruction is executed
    - ✓ **Data processing instr.** – the result is stored in registers
    - ✓ **Load instr.** – the data is loaded from main memory
    - ✓ **Store** – the data is stored in main memory
    - ✓ **Control** – the flow of execution may change (change IP)
  - Some instruction may be the combination of different types

