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- Fixed program computer: Function is specific and cannot be programmed

- Stored program computers: Programmed to carry out many different tasks/applications by keeping **data** and **instructions** STORED on them.

Efficient computing will happen when both are stored in same unit

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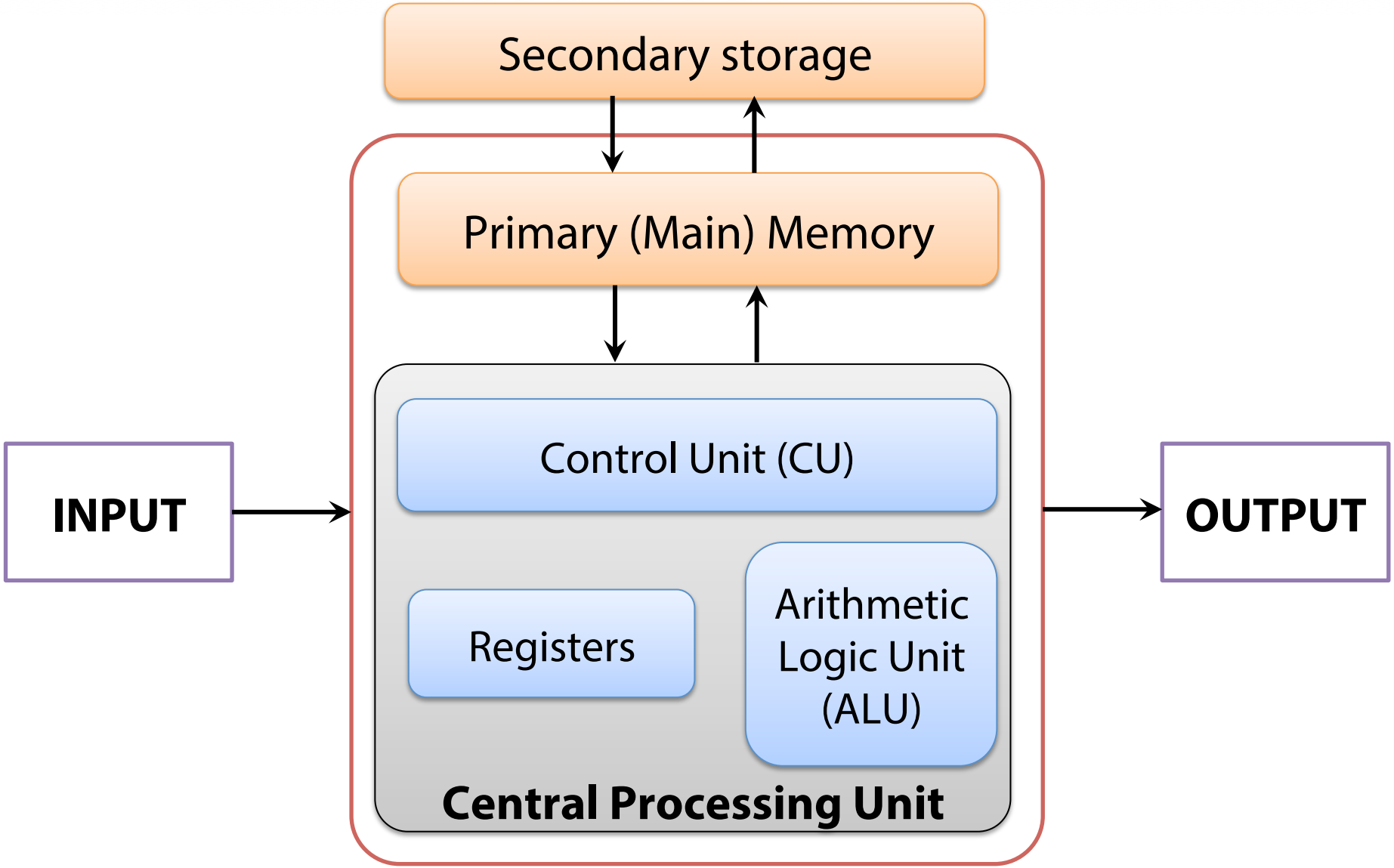
Computer architecture (John Von Newman)



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Control Unit (CU): Unit that manages instructions and communicates with both ALU and Primary memory. It controls sequential instruction, execution etc. essentially guides flow of data

ALU: Executes arithmetic and logical operations (comparison and relational operations)

Registers: limited temporary and very fast computer memory for storing instructions and data on CPU (actual processor). They are under control of CU. Different types of registers such as accumulator, instruction register, memory address registers, memory data registers, Program counter, and general purpose register.

Cache: High speed memory in-built between CPU and primary memory. Different levels L1, L2 and L3

CPU executes program using **fetch-decode-execute cycle**

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Microprocessor: is a CPU implemented on a single microchip

These are classified based on chip type, cores (quad core, dual core), processor type, word size, memory size, clock speed, cache

Word size: Maximum number of bits that a microprocessor can process at a time. We have 32 bit or 64 bit machines.

Clock speed: Number of instructions cycles a CPU can execute in a second. It is measured in MHz, GHz. 1 GHz is 1 billion cycles per second.

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Primary memory: stores data and instructions

RAM (Random Access Memory) – Volatile, retains data temporarily (Measures in Gigabytes).

ROM (Read Only Memory) – Non volatile memory (data which rarely changes such as boot loader that loads operating system).

Virtual memory: space allocated on storage devices

Units of storage

Binary digits (0 and 1) are basic units of memory/storage. These are called as bits

4 bits – Nibble
2 Nibble (8 bits) – 1 byte
1024 Byte – 1 KiloByte (1KB)
1024 KB – 1 Megabyte (1 MB)
1024 MB – 1 Gigabyte (1GB)
1024 GB – 1 Terabyte (1TB)
Next units are 1 Petabyte, Exabyte, Zettabyte and Yottabyte.

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Bus: is used for moving instructions and data around the system. Speed of bus is measured in MHz. There can various kind of buses such as system bus (made of data bus, address bus and control bus), storage bus, Expansion bus (SATA, USB). Parallel or serial bus

Operating system

System software to operate computer. It manages all resources of computer including its hardware CPU, RAM, disk etc. Within system it manages application program, utilities, drivers, users, file management,

Linux, Windows, Android, iOS

It provides interface for interaction of user with computer. This can be 'command-based interface', Graphical User Interface (GUI) etc.