

The CPU

Key Word	Description
CPU: Central Processing Unit	Brain of the computer, processes all data
CU: Control Unit	Executes program instructions, overall control of the CPU, holds PC
ALU: Arithmetic Logic Unit	Carries out calculations on data, contains the accumulator
Cache	Very fast memory but slower than registers, holds regularly used data
Registers	Memory Location than temporarily holds data
PC: Program Counter	Holds the location of the next instructions
Accumulator	Stores result of calculations from the ALU
MAR: Memory Address Register	Holds the memory address about to be used, from the address bus
MDR: Memory Data Register	Holds the actual data which has been used or is about to be used, from the data bus
CIR: Current Instruction Register	Instructions from the MDR are opened here
Address Bus	Carries addresses from the CPU to the RAM or the I/O Devices , it only goes one way
Data Bus	Carries data from the RAM to the CPU and goes two directions
Control Bus	Control signals are sent across

The CPU (cont)

<i>Fetch</i>	Copy memory address from the PC to the MAR , copy the instruction in the MAR to the MDR and increase the PC
<i>Decode</i>	The instruction in the MDR is decoded by the CU . It will then prepare for the next step
<i>Execute</i>	The instruction is performed, usually by the ALU

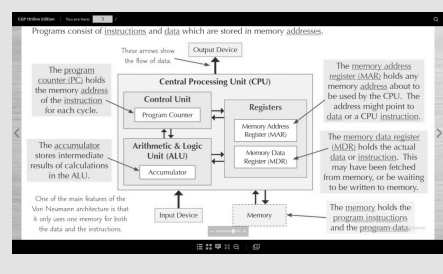
System Performance

Clock Speed	The <i>number of instructions</i> a single core can carry out per <i>second</i> (Hz) The higher the clock speed, the faster the computer
Number of Cores	You can <i>independently</i> process data. <i>More cores</i> means <i>more instructions</i> processed at a time
Disadvantages of Cores	Not all programs allow many cores to process data
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Cache Size	A <i>larger</i> cache means the CPU will be faster because it is easier for data to be accessed than it being in the RAM
More RAM	The <i>more RAM</i> , the <i>more applications</i> a CPU can smoothly run, making it faster

Primary and Secondary Storage

Key Word	Description
RAM: Random Access Memory, Main Memory	It can be read or written It is temporary All files are stored here when in use Slower than cache faster than secondary storage
ROM: Read-Only Memory	Non-volatile memory Contains instructions for a computer to boot up (BIOS)
BIOS: Basic Input Output System	Instructions in the ROM that a computer needs to boot up
Virtual Memory	When the RAM is full, a space on the HDD to store data that currently not in use.
Disadvantages of Virtual Memory	Disk Thashing Very slow compared to RAM The HDD is not geared to changing data frequently
Secondary Storage	Where files we want to keep is stored, mainly when it is not in use
SSD: Solid State Disk	No moving parts- fastest, quickest, reliable, durable Made from microchips and electrons pass through High Capacity
Examples of SSD	SD Card, USB Stick, SSD

Von Neumann Architecture



Primary and Secondary Storage (cont)

Optical Disk Laser Light burns marks unto a disk
Cheap, low capacity, Old-fashioned,
Portable
Not durable as easily scratched

Examples of
Optical Disk CD-ROM, DVD-ROM, Blu-Ray

Magnetic Tape Patterns of magnetism to read data
Noisy due to moving parts
Not very reliable, durable, highest
capacity and fast

Examples of
Magnetic Tape Hard Disk Drive, Floppy Disk,
Magnetic Tape

HDD: **Hard Disk Drive** High Capacity, Reliable
Between 5400 and 15000rpm
Backing up and transporting data

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By **Glory** (gloryo)
cheatography.com/gloryo/

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