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

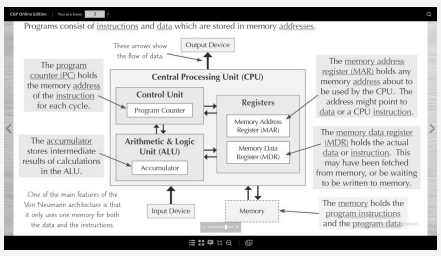
The CPU (cont)

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

System Performance

Clock Speed	The *number of instructions* a single core can carry out per *second* (Hz) The higher the clock speed, the faster the computer
Number of Cores	You can *independently* process data. *More cores* means *more instructions* processed at a time
Disadvantages of Cores	Not all programs allow many cores to process data
Disadvantages of Cores	Not all programs allow many cores to process data
Cache Size	A *larger* 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 *more RAM*, the *more applications* a CPU can smoothly run, making it faster

Von Neumann Architecture



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 Thrashing 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

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 transp-orting data