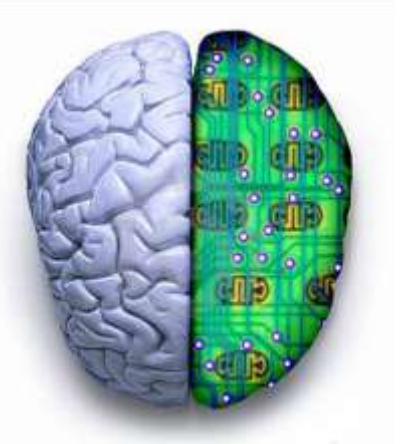
1.2 The Main Components of Computer Systems

- Describe the central processing unit including its role
- Describe internal memory, i.e. ROM and RAM and the differences between them
- Define input and output devices and describe the difference between them
- Define secondary/backing storage

1.2 The Main Components of Computer Systems

Describe the central processing unit including its role

- The CPU is the **'brain'** of the computer.
- It is where all the searching, sorting, **calculating** and **decision making takes** place.
- The speed of the CPU is measured in **Gigahertz** (GHz).
- A 1 GHz CPU can carry out 1 billion instructions per second!
- Intel and AMD are the most popular CPU brands.



1.2 The Main Components of Computer Systems

Main Memory

Applications are installed in the **Secondary Storage (Hard drive)**.

Temporary data from Applications in use are held in the **Main Memory.**

The CPU will **first check the Cache** for the **required piece of the data so that it can be processed.**

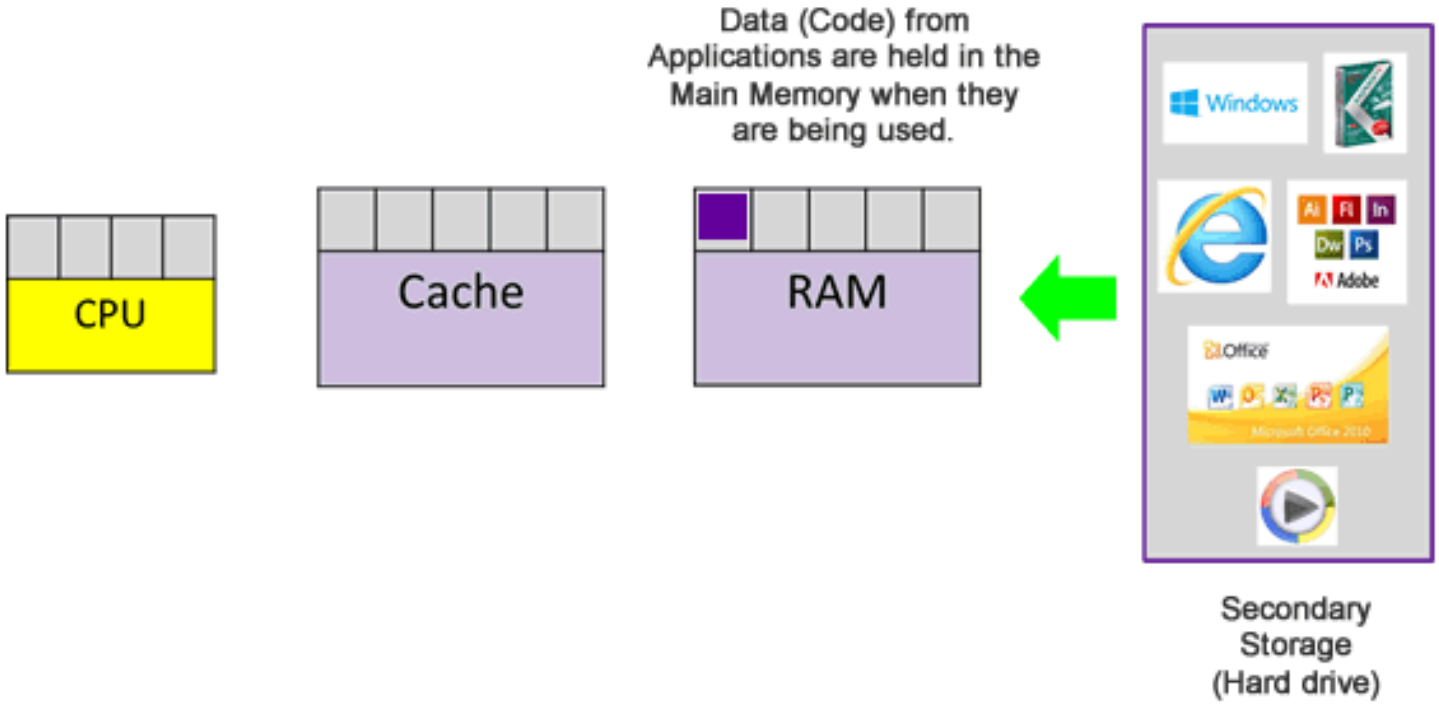
If the data is not in the cache then the **CPU will check the RAM** and **transfer data to the CPU**.

The Cache will then **transfer the next piece of data from the RAM into Cache**.

The CPU will again **check the Cache** for the next piece of data. This time the CPU will be able to get the data from the Cache Memory.

1.2 The Main Components of Computer Systems

Main Memory



Cache

- Cache is the fastest type of Memory.
- It is located between the processor and the RAM.
- Cache collects data from the RAM.
- Holds onto commonly used data.
- The Cache will automatically transfer the next set of data from the RAM in to the Cache so that it can be processed by the CPU.

RAM (Random Access Memory)

- **RAM** stands for **Random Access Memory**
- **RAM** is the part of the computer that temporarily stores the instructions that the computer is running whilst the data is being processed by the **CPU**.
- **RAM** is volatile which means that when the computer is **turned off all data is lost**

ROM (Read Only Memory)

- **ROM** stands for **Read Only Memory**
- **ROM** is a built in memory that **can not be changed (Read Only).**
- ROM normally holds the '**boot up**' instructions to start the computer – without it the computer wouldn't know what to do when on button is switched on **(e.g. the operating system will not start**).
- ROM is **non-volatile** memory which means that memory is **not lost when computer is turned off**.

1.2 The Main Components of Computer Systems

Describe the difference between the Cache, RAM & ROM?

Cache	RAM	ROM (Read only memory)
Fastest, CPU, Common Data	Temporary data, volatile (data lost on startup)	Read Only, Bootup & Non-volatile (Data not lost)

Exam Question

The Cache memory is the fastest type of memory. It is located between the CPU and RAM. It holds commonly used data. RAM (Random Access Memory) is a volatile type of memory which means all data is lost on startup. In contrast ROM (Read Only Memory) is non-volatile which means data is not lost on startup. The ROM memory is Read Only and contains boot up instructions. The RAM memory hold temporary data which is processed by the CPU.

1.2 The Main Components of Computer Systems

Input and Output devices

Devices need to be connected to a computer to allow data to be inputted and outputted.

The general name for these extra devices is 'peripheral devices'. They are usually categorised into input devices, output devices and storage devices.

Input	Output	Storage
	 	 

An **input device** is a device that can **pass date into the computer**

Devices that **take data from the computer** are known as **output devices**.

1.2 The Main Components of Computer Systems

Define secondary/backing storage

Backing storage is also known as **secondary storage**

Backing storage is non-volatile which means that data is not lost when computer is turned off.

Backing storage is used to store data for a long time (data can be read from and written to)

Users tend to **make copies of original files** on backing storage.

1.2 The Main Components of Computer Systems

Describe what is backing storage (secondary storage)?
Key Words: non-volatile, data, long time, Read, Write & copies

Exam Question

Backing storage also known as secondary storage is non-volatile which means that data is not lost when computer is turned off. An example of backing storage is a fixed hard drive. Data is stored for a long time and can be accessed at any point (Read and write). Users tend to make copies of original files on backing storage.