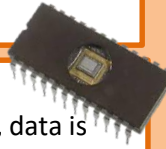


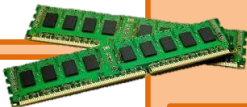
8.2 Memory and storage

Computer memory is a physical device capable of storing information temporarily or permanently.



- ROM stands for Read Only Memory.
- ROM is non-volatile. This means that without power, data is retained (safe/stored).
- ROM is read-only. This means that the data inside ROM is fixed. It can only be read, not written to.

- ROM stores the instructions required to boot up the computer.
- These instructions are called the BIOS(Basic Input Output System).
- The BIOS checks the hardware is functioning and loads the operating system into RAM.



- RAM stands for Random Access Memory.
- RAM is volatile, this means that without power, data is lost.
- RAM is editable, this means that what is stored in RAM read from and written to.

- RAM stores the Operating System once the computer has booted up.
- RAM also stores any program instructions and data that are open / running or in use.
- **any program/app that is open on your computer system is moved into RAM.*

Primary Storage is memory that can be accessed directly by the CPU: Registers, Cache, RAM, ROM.

Secondary storage is non-volatile hardware where data is stored when it is NOT in use.

The CPU can't access secondary storage directly, so program data is swapped into primary storage when opened.

- **Optical** storage uses discs.
 - A CD (Compact disc) can hold up to 700Mb. (40p)
 - A DVD (Digital Versatile Disc) can hold 4.7 Gb.(80p)
 - A BLURAY disc can hold 25Gb. (£3)
- Optical discs use a laser to read and write data.



- ✓ Portable
- ✓ Waterproof
- ✓ Shockproof
- ✓ Cheap

- ✗ Low capacity
- ✗ Scratched easy
- ✗ Very slow read-write speeds

- Hard disk drives are the traditional internal storage in PCs and laptops. They are also still the most common form
- A hard disk drive is made up of magnetic metal disks which spin very fast (5,400 – 15,000 revolutions per minute).
- The read write head on a moving arm reads data from and writes data to the sectors on the disk.



- ✓ Reliable
- ✓ Cheap
- ✓ High capacity
- ✓ Fast read-write speeds.

£50
2TB

- ✗ Not very durable.



- Solid state memory is made of flash memory.
- Flash memory is non-volatile memory that can be electronically erased and reprogrammed.
- Flash memory uses transistors (switches) that can either be ON (1) or OFF (0).

- ✓ Fast
- ✓ Durable
- ✓ Portable
- ✓ Moderate capacity

- ✗ Expensive for high capacity
- ✗ Limited life span.

Capacity
How much data the storage device can store.

Read-Write Speeds
How fast data can be written to (saved) and read from (opened) the device .

Portability
How easy the device is to carry around.

Durability
How resistant to damage the device is.

Reliability
How long the device will last (life span).

Cost
How much money the device is to buy.



Needs **both inputs** to be on in order to have the output as on



Needs a **minimum of one input** to be on in order to have an output of **on**



The **output** will always be the **opposite** of the **input**

8.2 Memory and storage

What I need to know:

1. What is memory?			
2. What does RAM stand for?			
3. What does ROM stand for?			
4. What are the main differences between RAM and ROM?			
5. What is the purpose of secondary storage?			
6. Provide examples of magnetic, optical and solid state storage devices			
7. List each of the storage characteristics and their definition			
8. List advantages and disadvantages of magnetic, solid state and optical technologies			
9. How does a NOT gate work?			
10. How does a OR gate work?			
11. How does a AND gate work?			