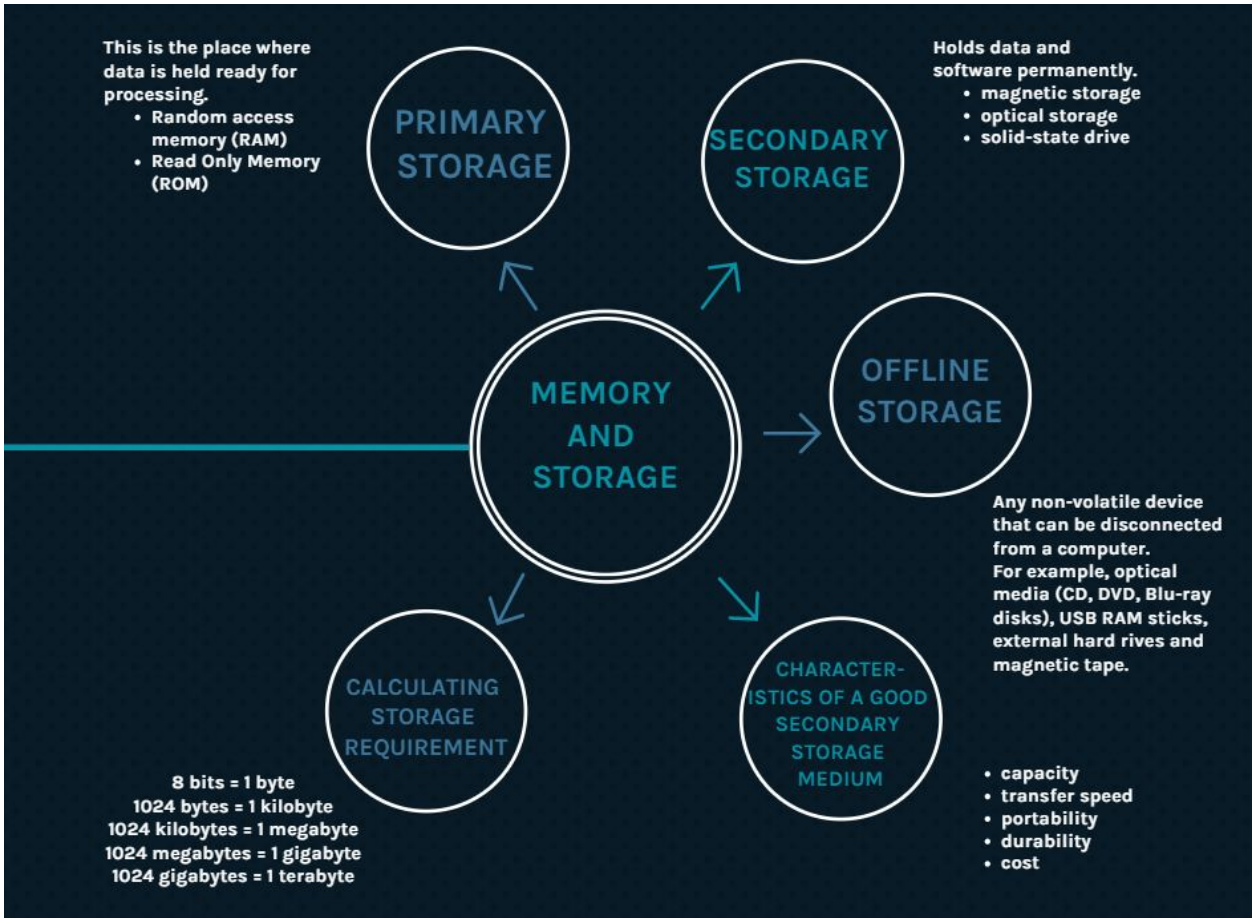
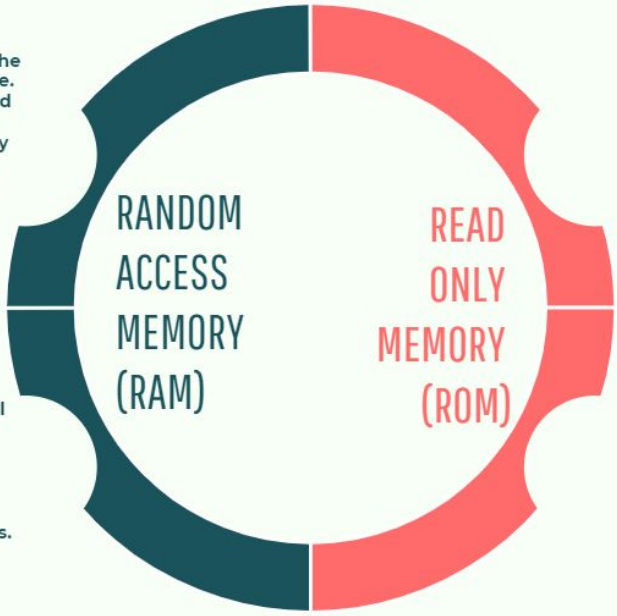

MEMORY AND STORAGE
PRIMARY STORAGE
This is the place where data is held ready for processing.
• Random access memory (RAM)
• Read Only Memory (ROM)
SECONDARY STORAGE
Holds data and software permanently.
• magnetic storage
• optical storage
• solid-state drive
OFFLINE STORAGE
Any non-volatile device that can be disconnected from a computer.
For example, optical media (CD, DVD, Blu-ray disks), USB RAM sticks, external hard rives and magnetic tape.
CALCULATING STORAGE REQUIREMENT
8 bits = 1 byte
1024 bytes = 1 kilobyte
1024 kilobytes = 1 megabyte
1024 megabytes = 1 gigabyte
1024 gigabytes = 1 terabyte
CHARACTER-ISTICS OF A GOOD SECONDARY STORAGE MEDIUM
• capacity
• transfer speed
• portability
• durability
• cost

PRIMARY STORAGE

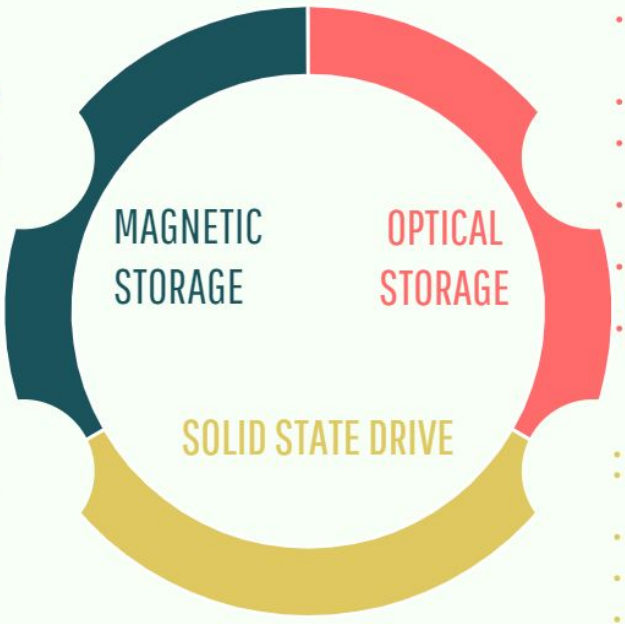
- Holds data to be processed along with the programs already in use.
- Can be written onto and read from.
- Data is held temporarily and is erased when no longer needed. RAM is volatile.
- Embedded computers only have a small amount of RAM because they only perform specialized functions and don't need to process a lot of data.
- However, general purpose computers will have more RAM, because they need to be ready to hold large amounts of data.
- RAM is built into peripherals like printers. The printer prints the data in RAM while the computer does other tasks.



- Can be read from but not written onto.
- ROM is non-volatile and doesn't lose its data when the computer is switched off.
- Embedded devices use ROM to store software, this software is known as 'firmware'.
- General purpose devices use ROM to store software which is called 'bootstrap'.
- Certain types of ROM can be erased and re-written to. This is called erasable programmable read only memory (EPROM).
- Upgrading firmware is known as flashing.

SECONDARY STORAGE

- Read, write and erase data by using electromagnets and magnetic fields to control tiny magnetic dots of data. These dots represent binary.
- They are either tape based or disk based.
- Tape-based devices use looped magnetic tape which passes over an electromagnetic read/write head.
- Disk-based devices consist of several disks known as platters. They have a magnetized coating. The data dots lie in tracks around the platter, which is attached to a rotating spindle. When the spindle spins the platters, data is read, written or erased.



- Data is read by shining a laser beam onto the surface of plastic disks.
- Data is written on the track by using a laser to make 'pits' which represent binary data.
- The areas in between pits are known as land.
- the process of recording data onto an optical disk is called 'burning'.
- Some types of optical disk are CDs, DVDs and Blu-ray disks.
- Optical media come in different types: ROM, -R, -RW
- Data stored on an optical medium is more portable than that on a hard disk drive

- Has no moving parts
- Some examples are USB RAM sticks, solid-state hard drives and SD cards
- Small in size but have a very high rate of transfer.
- Can be written to and read from many times.
- They are portable.