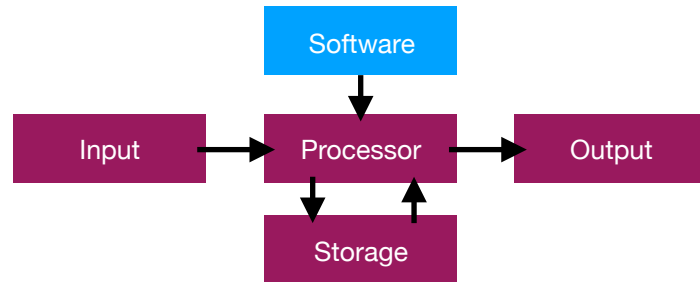# How Computers Work

A computer is an electronic device that can be programmed to do specific tasks. We input data into a computer, it is processed and it outputs new information. Computers are able to store data.

```
        Software
           │
           ▼
Input → Processor → Output
           ⇅
        Storage
```

General Purpose Computer
A computer that can be programmed and reprogrammed for many different tasks.

Examples: Desktop Computer, Laptop

Embedded Computer
A computer controlled device.
This is pre-programmed to do one task (or a limited set of tasks).
Examples: Washing Machine, Burglar Alarm

Hardware - The physical components of the computer

Inputs
Inputs allow computers to receive data from the physical world.
Sensors allow the computer to take automatic readings like temperature.
Other input devices allow us as humans to enter instructions or data.

Outputs
Outputs allow computers to give out information in a way that humans can experience it (using our senses) or allow the computer to change the physical environment.

Processors
Processors do the actual calculations inside the the computer.
　　CPU - Central Processing Unit - The brain of the computer.
　　GPU - Graphics Processing Unit - The Graphics Card

Storage Devices
Storage devices hold data and instructions (programs) so that they can be sent to the processor when needed.
　Primary Storage - is used to hold data for immediately for processing
　　RAM - Random Access Memory - Thinking Memory
　　ROM - Read Only Memory (eg BIOS, Firmware)
　Secondary Storage - is used for long-term storage like saving files.
　　HDD - Magnetic Hard Drive
　　SSD - Solid State Drive
　　Flash Drives (USB) - Memory Sticks

Software
The programs that tell the computer how to process data and output new information.

Off-the-shelf Programs
Programs that are available in shops or for download.

Bespoke Programs
Programs that have been made especially for a company or person to do a specific job (or set of jobs).

Type of Software	Description
System	Gives the user an interface with the computer and runs tasks that look after the hardware and data stored.
Operating System	Software that controls the hardware and provides the user interface (e.g. Windows, OSX, Android)
Utility Software	Software that looks after the data (e.g. Antivirus Software)
Application Software	Programs that are not essential to the running of the computer, but help us complete tasks that we want to do.
Generic Software	One program that can be used to complete many (similar) tasks (e.g. spreadsheet, presentation software)
Specific Software	One program designed to complete one task (e.g. A web browser, accounts software)
Integrated Software	Many programs that can work together (with a similar user interface) to complete a variety of different tasks (e.g. MS-Office, Adobe Creative Suite)

```
              Software
             /        \
        System      Application
        /    \      /    |    \
Operating  Utility Generic Specific Integrated
 System
```