COMPUTING SYSTEMS

Modern computer systems receive an input, process that data and then produce an output. The data can be sored in memory. They are designed to automate any process by a program. To execute programs that operate on data.

Computing systems need a **processor**, **memory**, and **storage**. Modern systems also rely heavily on **communication** between them.

Communication Computing systems exchange information and form networks
Programs and **data** are transferred between computing systems, when required.

"AI has by now succeeded in doing essentially everything that requires 'thinking' but has failed to do most of what people and animals do 'without thinking' – that, somehow, is much harder!"
Donald Knuth, author of *The Art of Computer Programming, in **1981***
Programming computers to learn from experience

The processor (CPU)the component that **executes** program instructions.

An instruction may:

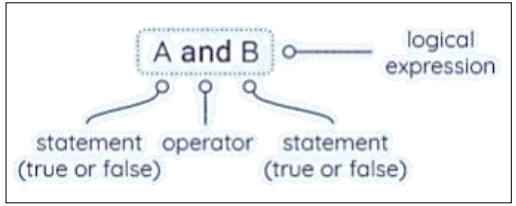
- Perform arithmetic or logic operations on data
- Perform input/output of data
- Control program flow

The **storage** (secondary memory) is the set of components that **stores** programs and data.
Storage is **persistent**: it retains its contents when the power is off.

Main memory is referred to as RAM.
The main component that **stores** the programs and data **currently in use**.

Memory is **volatile**: its contents are lost when the power is off.

Logical operations operate on statements that are **true** or **false**. There are three basic logical operations. AND OR NOT



Logical expressions — **logic circuits** can be represented using diagrams

Logical operations — logic gates can be represented using symbols

FREE or OPEN software is where creators of a program can choose to provide access to its **source code**. This means that anyone can 'see inside' the program to understand how it works, check for errors, suggest improvements, and 'remix' it. Whilst still acknowledging the source.