Computing Systems

What is software?

Software simply means programs, such as word processers, web browsers, image editors, or operating systems.

What is artificial intelligence?

A machine that performs tasks that typically we think of as requiring human intelligence.
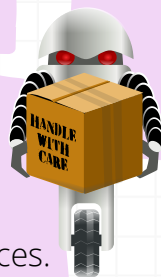
There is no agreed definition, as AI is continually evolving.
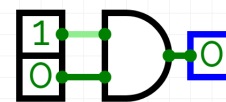
Machine learning

Machine learning is a subset of AI. We 'train' machines to learn from examples and experiences. Methods include:
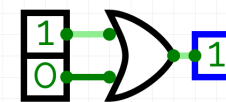- Supervised learning
- Unsupervised learning
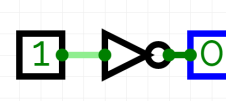- Reinforcement learning
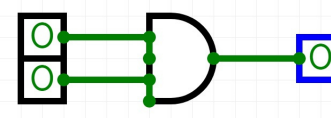
Logic Gates:

AND Gate   OR Gate

NOT Gate   XOR Gate

Truth Tables:

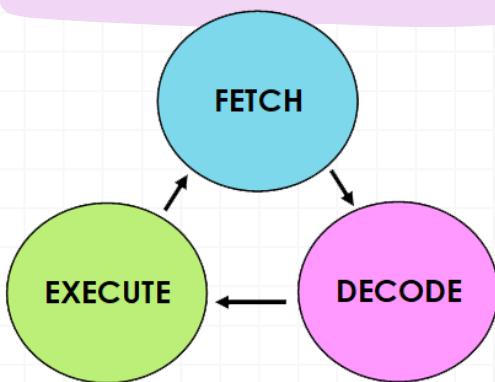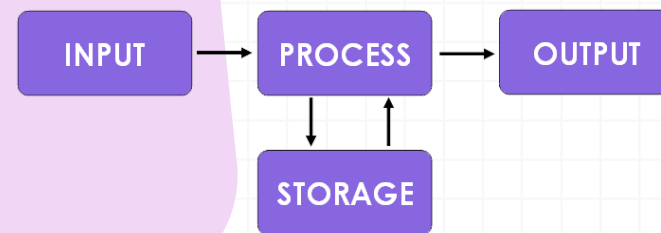AND logic gate and truth table. A truth table shows all possible outputs from a gate.

A	B	X
0	0	0
0	1	0
1	0	0
1	1	1

The Fetch-Decode-Execute Cycle

The processor (CPU) is commonly known as the brain of the computer. It **executes** program instructions. For example:
- You want to add two numbers together
- The processor fetches the add instruction from memory (RAM), along with any data it needs
- The processor then decodes the instruction
- The processor then executes the instruction by adding the numbers together
- The result of the calculation will often then be put into memory

INPUT → PROCESS → OUTPUT
PROCESS ↔ STORAGE

FETCH → DECODE → EXECUTE → (cycle)

Hardware Components

RAM (Random Access Memory - Volatile Storage))

CPU (Central Processing Unit)

Hard Drive (Persistent Storage)

Raspberry Pi - Motherboard Example

Headset (Input & Output Device)

Mouse (Input Device)

Monitor (Output Device)