



GMT

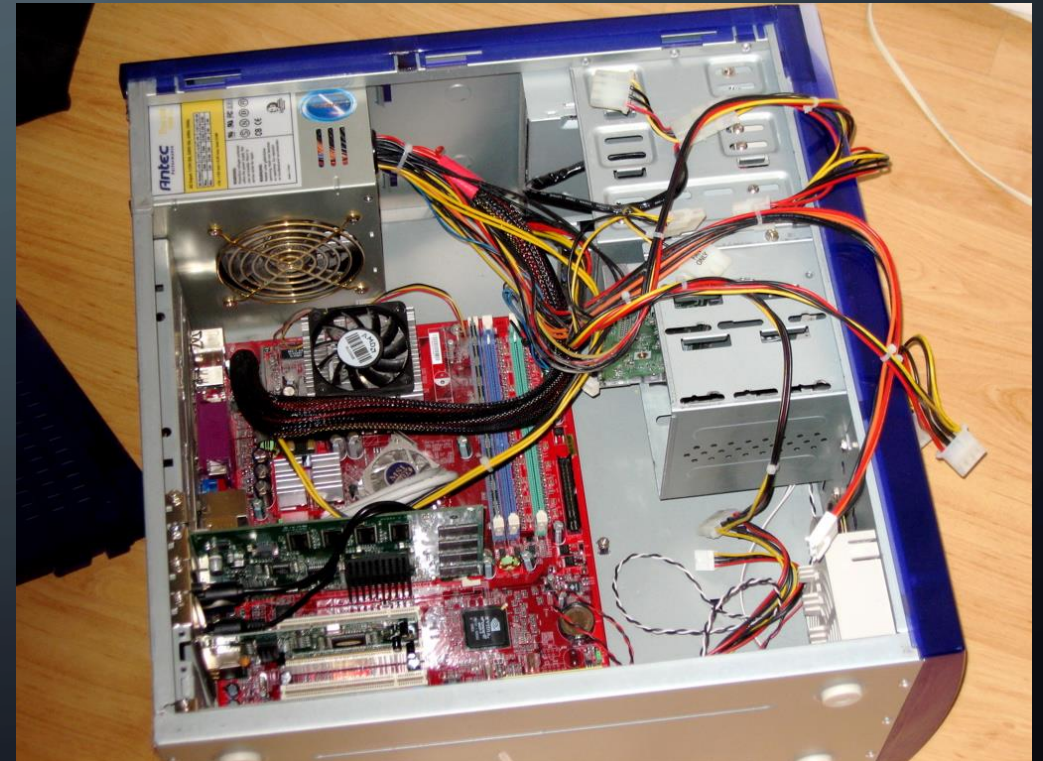
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY

COMPUTER ARCHITECTURE & TECHNOLOGY CONVERGENCE

Lecture 2

A Brief History of Computing
and System Hardware

What's inside your computer?:



PRINCIPAL COMPUTER COMPONENTS

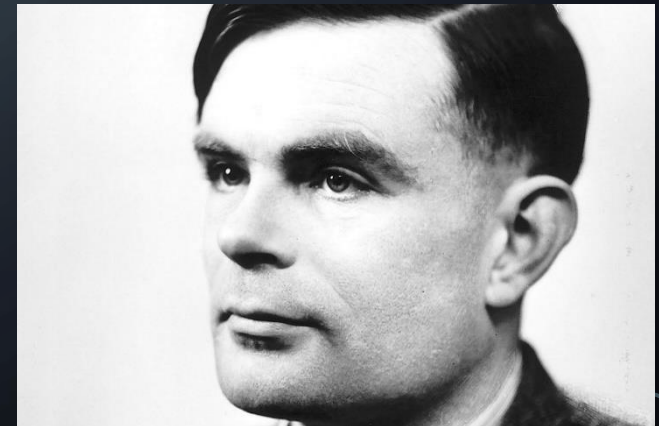
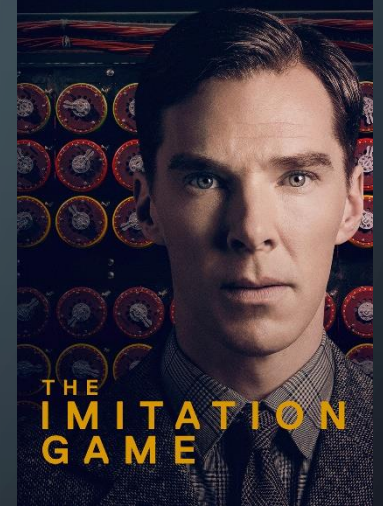
- CPU – Central Processing Unit - coordinates all system actions, executes program instructions.
- Motherboard - connects all components together
- Memory (RAM) – used to store information.
- Hard disk drive (HDD)
- Graphical Processing Unit (GPU) – Converts computer data into content suitable for a monitor.

PRINCIPAL COMPUTER COMPONENTS

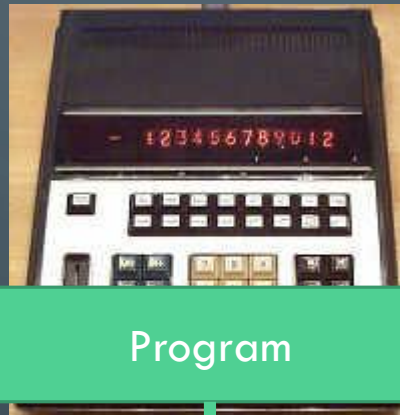
- Computer case and power supply
- I/O Devices – Input/Output devices, which allow you to receive or display data.
 - Monitor
 - Mouse/Keyboard controller
 - USB ports
 - Ethernet controller

WHERE DID THIS COMPUTER ARCHITECTURE EMERGE FROM?

- Early computing - War-time research
 - WW1 - WW2
- Alan Turing
 - Proposed a universal computational device in 1937
 - Developed Bombe computer to break Enigma Code
 - Estimated to have shortened war by more than 2 years and saved 14 million lives



WHERE DID THIS COMPUTER ARCHITECTURE EMERGE FROM?



Program

Input Data

Computer
(Data Processor)

Output Data

Class name

Main method

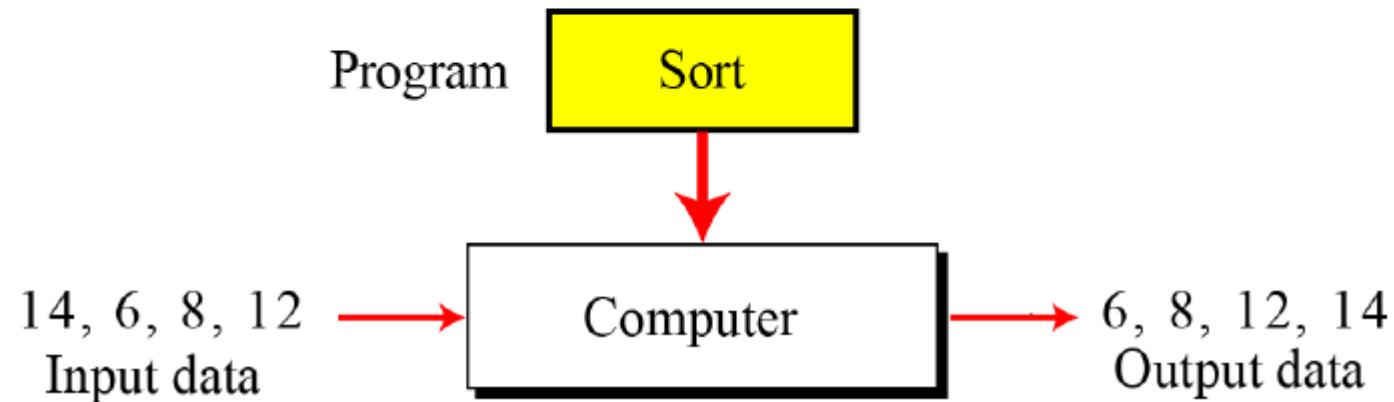
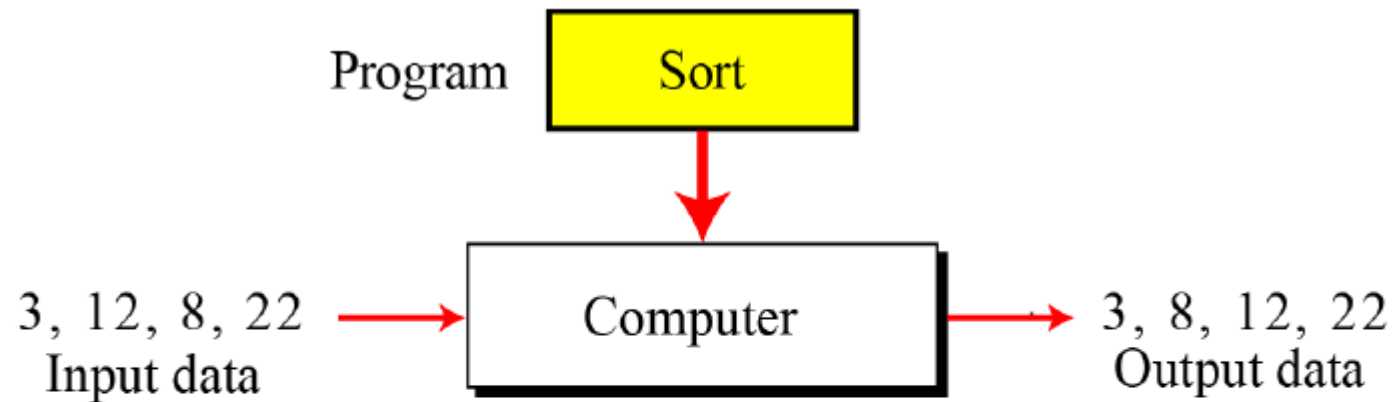
```
public class MyFirstProgram
{
    public static void main (String [] args)
    {
        System.out.println("hello world!");
    }
}
```

Class body

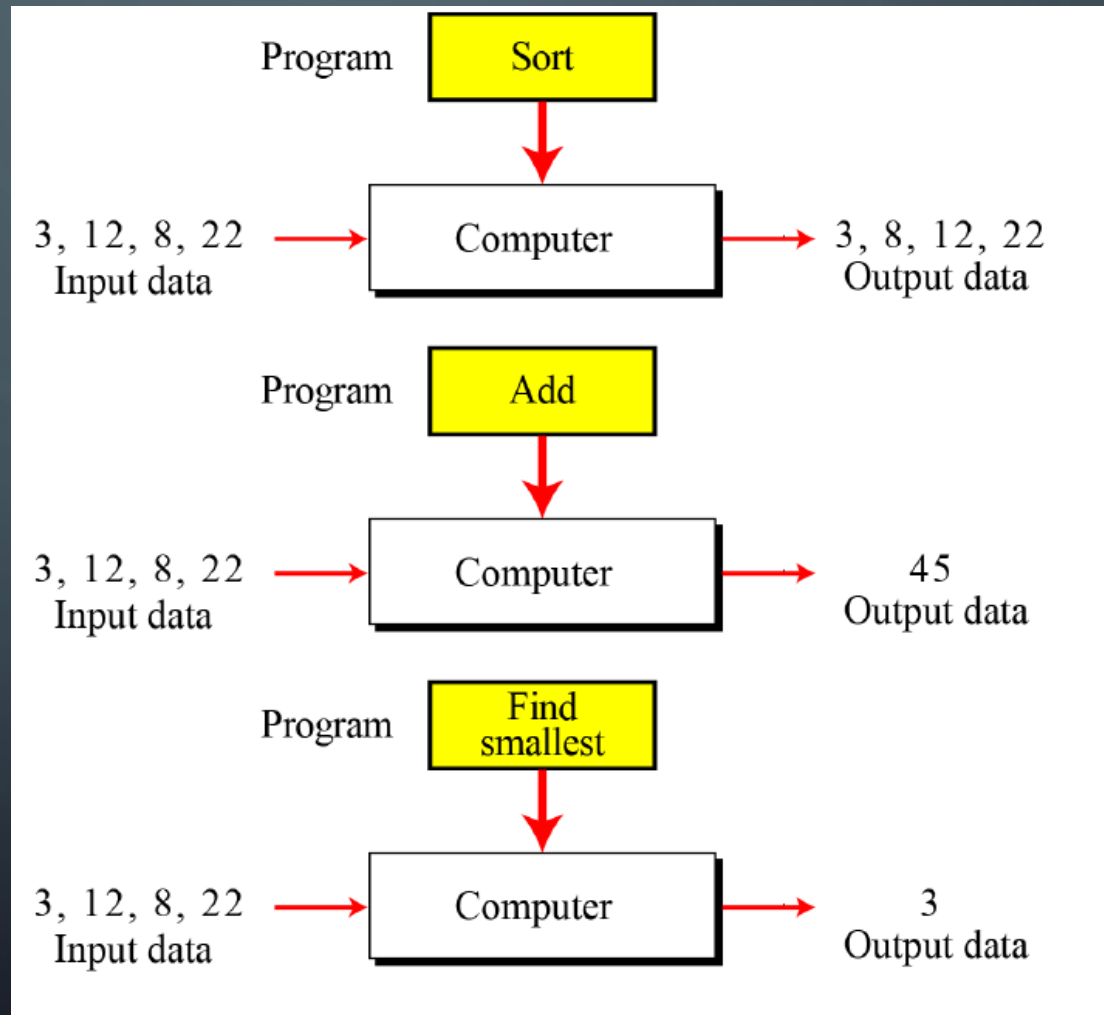
Instruction



WHERE DID THIS COMPUTER ARCHITECTURE EMERGE FROM?



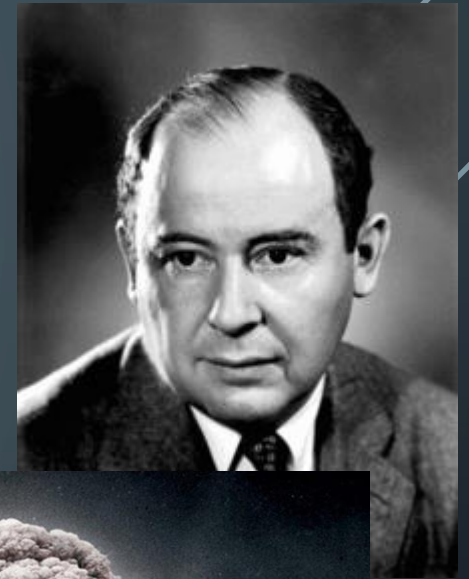
WHERE DID THIS COMPUTER ARCHITECTURE EMERGE FROM?



UNIVERSAL TURING MACHINE

- A machine that can do any computation if the appropriate program is provided
- Capable of computing anything that is computable
- All modern computers are Turing complete

VON NEUMANN

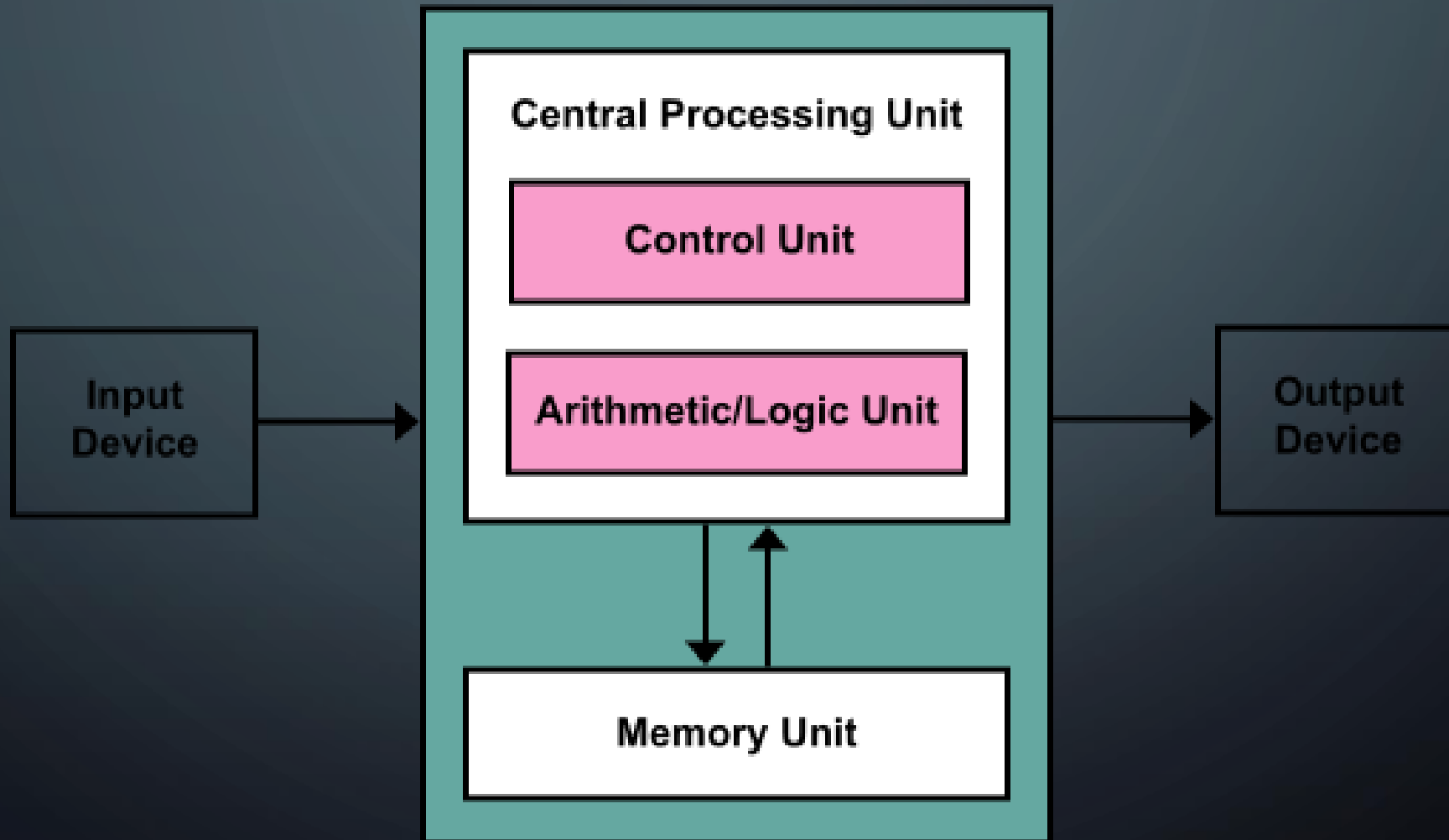


23543678
x 25379152

???



VON NEUMANN SUBSYSTEMS





GMT

INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY