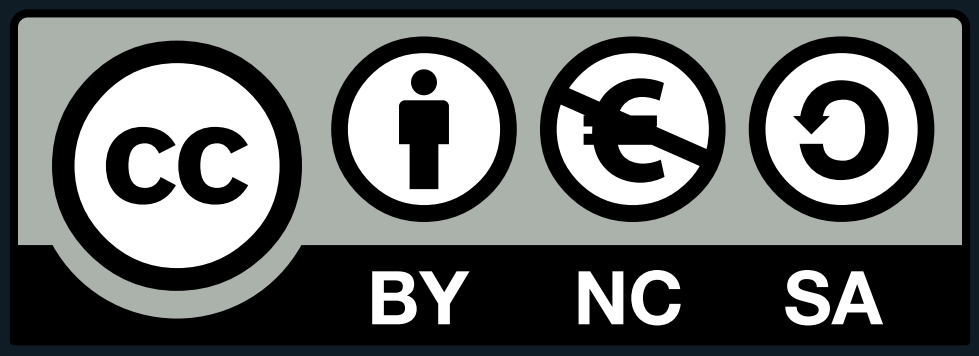
Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)



You are free to:

Share - copy and redistribute the material in any medium or format

Adapt - remix, transform, and build upon the material

@mrgibsonict

Ada Lovelace (1815 - 1852)

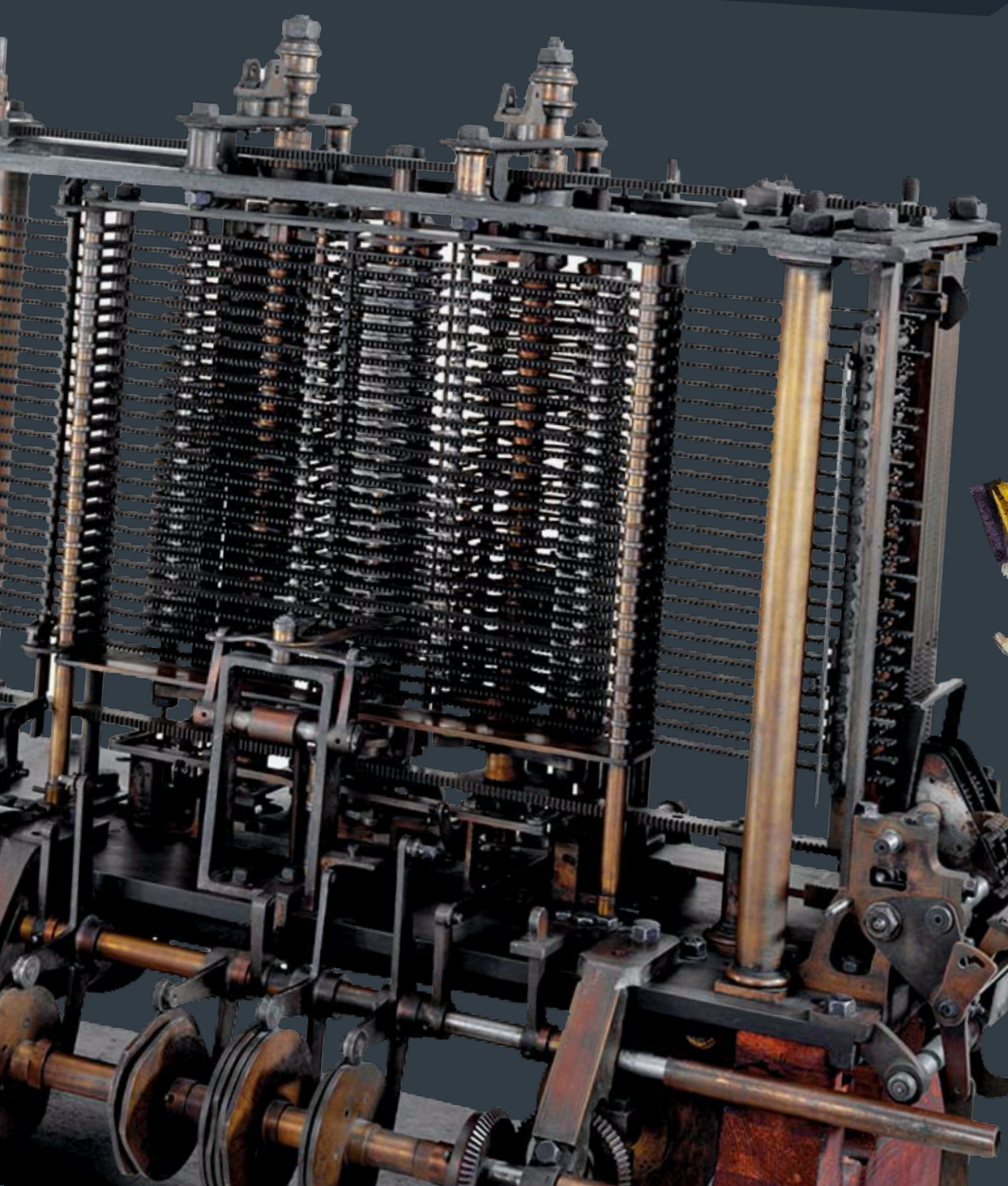
Ada Lovelace was an English mathematician and writer, chiefly known for her work on Charles Babbage's proposed mechanical general purpose computer, the Analytical Engine. She was the first to recognise that the machine had applications beyond pure calculation, and published the first algorithm intended to be carried out by such a machine. As a result, she is sometimes regarded as the first to recognise the full potential of a "computing machine" and the first computer programmer.

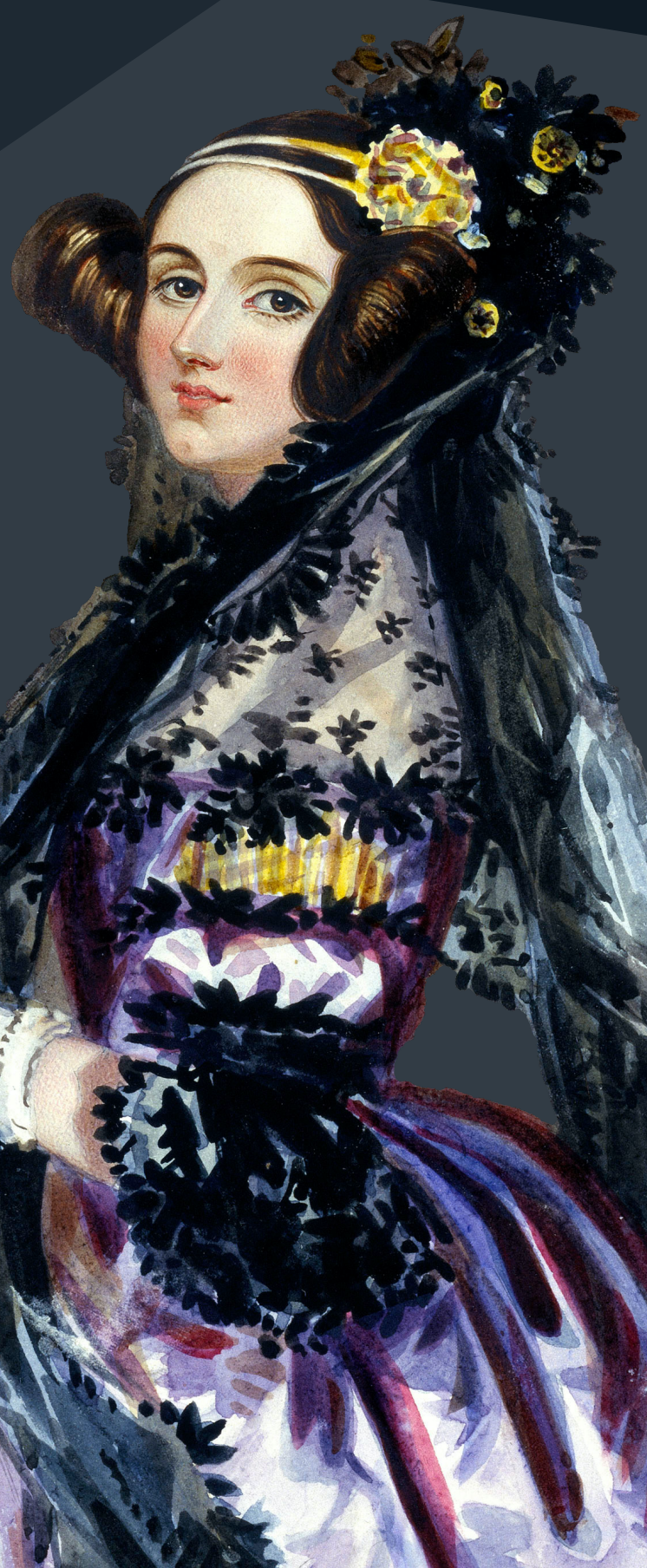
The Analytical Engine

The proposed Analytical Engine was a General Purpose Computer featuring many features found in modern computer architectures including an Arithmetic Logic Unit, Control Flow and Intergrated memory. The Analytical Engine was not built in Ada's life time due to technological limitations. A fully working model was evenutally built in 1991 and resides in London's Science Museum

Algorithm

"a process or set of rules to be followed in calculations or other problem-solving operations"





Grace Hopper (1906 - 1992)

Admiral Grace Hopper was an American computer scientist and United States Navy Rear Admiral. One of the first programmers of the Harvard Mark I computer, she was a pioneer of computer programming who invented one of the first compiler related tools. She popularised the idea of machine-independent programming languages, which led to the development of COBOL, an early high- level programming language still in use today.

COBOL

COBOL was one of the first high level programming languages and was designed to be much closer to the English languages than assembly code and lower level languages. Even though it has been superseded in both usefulness and features, it is still used in the backbones of many legacy systems around the world. With few programmers who can still use the language, those that can are widely sort after.

High Level Languages

“a programming language that makes use of natural language elements making it easier to write and understand programs”


```
UTE-GROSS-PAY.
IF HOURS-WORKED > 40 THEN
    MULTIPLY PAY-RATE BY
    MOVE 40 TO REGULAR-
    SUBTRACT 40 FROM HO
    MULTIPLY REGULAR-HO
    MULTIPLY OVERTIME-
        GIVING OVERTI
    ADD REGULAR-PAY T
SE
    MULTIPLY HOURS-WO
D-IF
```

Dr Kathleen Booth (1922 - Present)

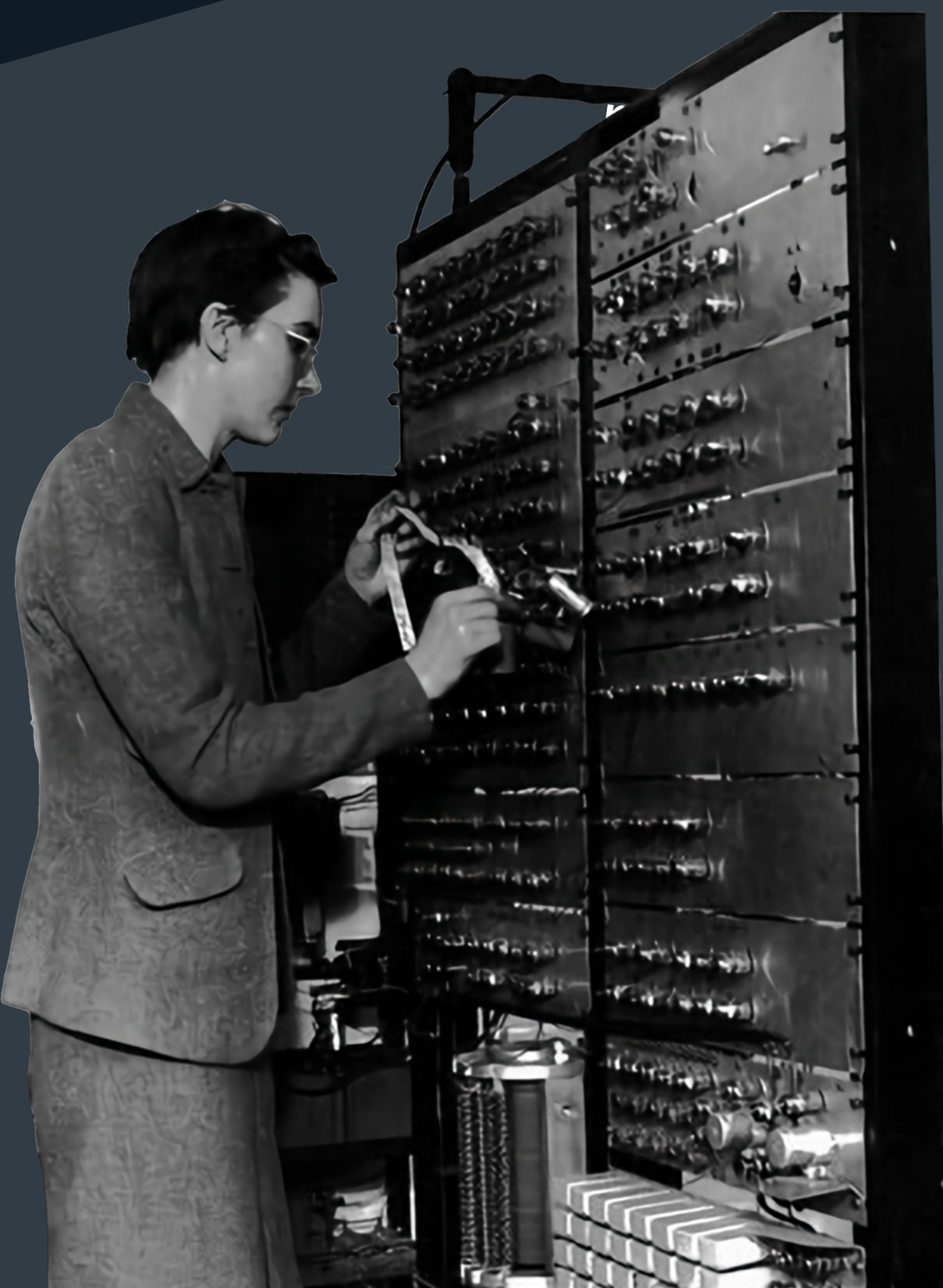
Kathleen Booth wrote the first assembly language and designed the assembler and autocode for the first computer systems at Birkbeck College, University of London. Booth went onto program neural networks which simulated how animals recognise pattens in the late 1950s.

Neural Networks

“a computing system inpsired by how our brains work. As opposed to being programmed, these systems learn by themselves.”

Assembly Languages

A low level language where each command corresponds directly to a CPU instruction. Each CPU has their own language which makes it difficult to move programs between different computers. Most programs are written in high level langauges.



```
.text
    mov rax, 1
    mov rdi, 1
    mov rsi, message
    mov rdx, 13

    mov rax, 60
    mov rdi, rdi

.data
message: db "Hello, World",
```

Melba Roy Mouton (1929 - 1990)

Melba Roy Mouton served as Assistant Chief of Research Programs at NASA's Trajectory and Geodynamics Division in the 1960s and headed a group of NASA mathematicians called "computers".Starting as a mathematician, she was head mathematician for Echo Satellites 1 and 2, and she worked up to being a Head Computer Programmer before becoming a Program Production Section Chief at Goddard Space Flight Center.

The Space Program

Women in computing made massive contributions to the effort to put humans on the moon.

Human Computers

A ‘computer’ used to be someone who worked out calculations. When electronic computers became common place, the human computers, who were predominantly female, often became programmers. In the earlier years of computing women made huge contributions to the field.

Sophie Wilson (1957 - Present)

Sophie Wilson is a British computer scientist and software engineer. Wilson designed the Acorn Micro-Computer, the first of a long line of computers sold by Acorn Computers Ltd, including its programming language BBC BASIC. Wilson later designed the instruction set of the ARM processor, which became the de facto model used in 21st- century smartphones.

Instruction Set

“the complete set of all the instructions in machine code that can be recognised and executed by a central processing unit. There are two types of instruction sets: CISC & RISC”

ARM Processors

ARM processors use simplier instructions and less power than traditional x86 processors this makes them smaller and more ideal for a wide range of different devices. They are found in almost everything that contains electronics: Fridge Freezers, Cars, Thermostats, and even your smartphones. There’s a push to replace the more power hungry CPUs in our Desktop and Laptops with lower power ARM processors.

Marissa Mayer (1975 - Present)

Marissa Ann Mayer is an American information technology executive, formerly serving as the president and chief executive officer of Yahoo! She was the first female software engineer at Google (Employee #20), and before leaving was responsible for a wide range of their services and products. She has now started her own company focusing on artificial intelligence.

Artificial Intelligence

A branch of Computer Science with the aim of designing systems, which are capable of performing tasks that require human intelligence, such as: voice recognition, perception, and complex decision making. We are currently capable of creating “narrow AI”, which is able to do one intelligent task very well. The aim is to be able to create “general AI”, which will be able to carry out a wide range of intelligent tasks better than a human is capable of.

Software Engineer

A software engineer is a person who applies the principles of software engineering to the design, development, maintenance, testing, and evaluation of computer software.

Margaret Hamilton (1936 - Present)

Margaret Hamilton is a computer scientist and software engineer. In the early 1960s, whilst working in an MIT lab, she wrote software for: detecting aircraft; tracking satellites and predicting the weather. Later, she led the team that wrote the flight software for the Apollo 11 Lunar lander. She is credited with being the first person to use the term “software engineer”, giving it equal footing to the male-dominated field of hardware engineering.

Software Engineering

Software engineering is the process of creating software from identifying the requirements, planning, writing code, through to quality control and testing. A person with the role of a software engineer will oversee the whole process, similar to a project manager.

Apollo 11 Computer

The computer used on the Apollo 11 Lunar module has some interesting properties. The software written by Margaret’s team was stored by hand weaving the program into memory called “Rope Memory”.

Radia Perlman (1951 - Present)

Radia Perlman is an American computer programmer and network engineer. Radia graduated from MIT in the late 1960s and later worked on LOGO: an educational progrmaming langauge best known for Turtle Graphics. Radia later went onto develop the Spanning Tree Protocol - an important networking protocol, which allowed for larger networks to be created whilst reducing loops and errors.

Computer Network

“A computer network is an interconnected group of computers that can communicate and share common resources. These computers can be connected by wires or wireless signals.

Spanning Tree Protocol

When on a large network, there can often be multiple routes to different computers. These redundant routes create loops, which can cause sent data to never be received, and evetually crash the network. The Spanning Tree Protocol analyses the network and blocks off redundant routes. This protocol was vital to the creation of large corporate networks and the internet.