**Al-Khwarizmi**

This Persian scholar famous for putting together a complete understanding of **algebra**as the field of mathematics we all know and love, and other notable works in astronomy, geography and now we can hear his influence in the form a term used by many without really knowing about its origin: **Algorithm!**

**Blaise Pascal**

A French inventor well known for his contributions to physics and mathematics was also the first to build a **mechanical calculator** called the *Pascaline*, a kind of precursor to the computer. A unit of pressure (*Pa*) and a programming language were named in his honor.

• în 1642, când încă nu avea 19 ani, crează Pascaline

• un calculator mecanic • capabil de adunări/scăderi (utilizat pentru calcul de taxe)

• nu a fost o mașină practică • mai puțin de 50 au fost create

• era utilizată pe post de “jucarie” pentru aristocrație

• limbajul Pascal e numit în onoarea lui

Gottfried Wilhelm von Leibniz

• toate contribuțiile lui sunt imposibil de enumerat

• două contribuții majore:

• studiază sistemul binar

• extinde mașina lui Pascal, adăugând operațiile de înmulțire și împărțire – tot o mașină mecanică creată în 1673

**Charles Babbage**

*The father of the computer* is a common name for this English polymath credited with the design of a mechanical computer, the **analytical engine**, with things like *control flow* and *memory*, essential features the modern computer.

proiectează Mașina Diferențială Nr. 2 (Difference Engine No. 2)

• doar teoretic, design-ul este realizat de abia în 1991

• totuși, este prima mașină de calcul (mecanică) programabilă

• prototipurile sale aveau deja peste 13 tone

• este considerat “tatăl calculatoarelor moderne”

George Boole

Programmers and electronic engineers have a lot to thank to this self-taught mathematician for developing Boolean algebra. Those bit operations, Boolean variables and logic gates will not be the same without his rules.

• scrie “The Laws of Thought” (1854) • introduce logica booleană și analizează operațiile de bază • negația • conjuncția • disjuncția • disjuncția exclusivă • toate acestea stau la baza teoriei informației

**John von Neumann**

Regarded as a genius for his ability to apply math and physics to solve very hard problems (including the *Manhattan Project*), this Hungarian scientist is a big name in computer science for defining the **computer architecture**we use to arrange our hardware components.

considerat unul dintre cei mai buni matematicieni ai ultimului secol, aduce contribuții în numeroase domenii • ajută la crearea primul calculator electronic ENIAC (Electronic Numerical Integrator And Computer), 1939-1944 • îmbunătățește ENIAC ajutând la crearea EDVAC (Electronic Discrete Variable Automatic Computer), sistemul este binar și are programe stocate

**Alan Turing**

Famous for breaking the **Enigma machine** code with an electromechanical computer, helping the allies in WWII and coming up with things like the **Turing machine** or the **Turing test,** popularised by the movie *Blade Runner*. He had a tragic ending, killing himself with a poisoned apple after being castrated as punishment for his homosexuality.

• celebru pentru publicul larg pentru contribuția lui în spargerea rapidă a mesajelor Enigma utilizând mașina “The Bombe”

• practic, mașina făcea un brute-force search pentru a reduce numărul de posibilități în decriptarea mesajelor

• introduce Mașina Turing

• un model teoretic pentru a implementa orice algoritm

• conceptul de Turing-complete • intuiția: un sistem care poate recunoaște și analiza seturi de reguli pentru manipularea datelor (o cantitate infinită, teoretic)

• introduce Testul Turing • The imitation game: “The original question, ‘Can machines think!’ I believe to be too meaningless to deserve discussion” A. Turing

**Claude Shannon**

Another cryptanalysis hero in World War II that was only 21 years old when he wrote a thesis applying *Boolean algebra* to electronics. But his crown achievement was without a doubt his work on **information theory** with fundamental applications for sending data in telecommunications or calculating password strength with his *entropy function*.

• considerat “părintele teoriei informației” • trei contribuții excepționale: • demonstrează faptul că probleme de logică Booleană pot fi rezolvate cu circuite electronice • teorema de eșantionare Shannon-Nyquist (de la analog la digital și înapoi, fără a pierde ceva)

**Ada Lovelace**

Daughter of the poet Lord Byron, this English mathematician is considered to be the **first computer programmer**. Let me be clear: not the first woman programmer, the first *person*programmer. Ada published an algorithm that could be executed in *Babbage’s analytical engine* (if it had been build).

• colaboratoare a lui Babbage • scrie primul program, calculează numere Bernoulli • nu existau limbaje de programare, dar ea a descris o serie de pași care sa fie executați de o mașină • este considerată primul “programator”

Konrad Zuse

• introduce o serie de calculatoare: Z1, Z2, Z3 și Z4 • primele prototipuri în 1940-1941 • folosește sistemul binar • instrucțiunile sunt stocate pe o bandă • introduce reprezentarea și calculul în virgulă mobilă • face aproape totul în izolare (1936-1945)

**Grace Hopper**

The programming world is filled with women like this admiral of the US Navy that was a key contributor in the development of early **high-level programming languages** like *COBOL*, widely use today in the banking sector. Fun fact, she was the recipient of the first *Man of the Year*award by the Data Processing Management Association.

**Margaret Hamilton**

That pile of papers in the photo is a printed version of the code written by this computer scientist for the on-board **software for Apollo**ships that put the first humans on the moon. She was a pioneer of making a career out of *software engineering* when that was not even a job.

**Barbara Liskov**

Experienced software developers may recognise his surname as it gives name to a quite useful design pattern known as the **Liskov sustitution principle**and other notable works in *distributed computing*.

**Richard Hamming**

Telecommunications have a lot to thank to this *Bell Labs* employee, also another member of the Manhattan Project, his invention of the **Hamming code** gives us the ability to keep data integrity when send over long distances.

**Rivest Shamir Adleman**

The creators of the first public key cryptosystem: *RSA*, that uses a property of prime numbers and an ingenuous protocol to cipher messages, the first use of **public-key cryptography**. Without this, money transactions over the Internet will be way less secure.

**Diffie-Hellman**

The **Diffie-Hellman key exchange** was the solution to sharing a secret in an insecure channel of communications, a problem that really needed solving if we want to start a *private communication* over the Internet.

**Ritchie and Thompson**

This *Bell Labs* employees alongside *Brian Kernighan*develop the **C programming language**and lay the foundation for the f*ree software movement*with the creation of the **Unix**operating system. Other projects include languages like *Go* or *B*(*a* precursor to *C*)and the *Plan 9* operating system.

**Linus & Stallman**

*Richard Stallman* is an activist, pioneer contributor of free software with the **GNU Project (GNU’s not Unix --- primul acronim recursiv)**and supporting the growth of concepts like *copyleft*, *GPL*and *open source*. *Linus Tolvalds* is a Finnish developer, creator of the **Linux**operating system and the popular version control system **git**.

**Jobs vs Gates**

*Steve Jobs* co-founding **Apple** with *Steve Wozniak*, **Pixar** on his own and making himself a media figure. *Bill Gates* was able to be the wealthiest man alive for several years thanks to the success of **Microsoft**.

**Bezos and Zuckerberg**

Apart from the big success of **Amazon**, Jeff Bezos is investing in cloud computing and Artificial Intelligence with his *Amazon Web Services*(**AWS**) and **Facebook** released several frameworks like *React*or *GraphQL* pushing the software industry forward.

**Page and Brin**

Founders of the big one: **Google**. *Larry Page*and *Sergey Brin*are the fathers of a company synonymous with innovation. *Google*: *communications*, *navigation*, *storage*, *translation*, *office tools*, *education*, *ads*, *shopping*…

**Bjarne Stroustrup**

Bjarne Stroustrup is a Danish computer scientist, most notable for the invention and development of the **C++ programming language**.

**Guido van Rossum**

Guido van Rossum is a Dutch programmer best known as the creator of the **Python programming language**.

**Brian Kernighan**

Kernighan's name became widely known through co-authorship of the first book on the **C programming language** (The C Programming Language) with Dennis Ritchie. Kernighan affirmed that he had no part in the design of the C language ("it's entirely Dennis Ritchie's work").

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