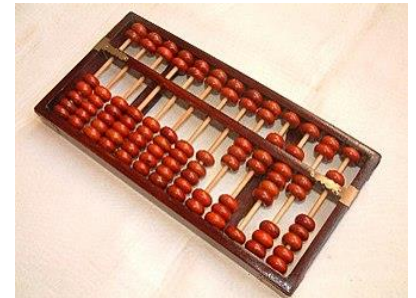


The History of Computer Development

500 BC

Abacuses come in different designs. Some designs, like the bead frame consisting of beads divided into tens, are used mainly to teach arithmetic, although they remain popular in the post-Soviet states as a tool. Other designs, such as the Japanese soroban, have been used for practical calculations even involving several digits. For any particular abacus design, there are usually numerous different methods to perform a certain type of calculation, which may include basic operations like addition and multiplication, or even more complex ones, such as calculating square roots. Some of these methods may work with non-natural numbers (numbers such as 1.5 and $\frac{3}{4}$).



Abacus (500 BC)

1642

The Pascaline was designed and built by the French mathematician-philosopher Blaise Pascal between 1642 and 1644. It could only do addition and subtraction, with numbers being entered by manipulating its dials. Pascal invented the machine for his father, a tax collector, so it was the first business machine too (if one does not count the abacus).



Pascal's Adding Machine
(Pascaline) (1642)

Punch Card in Punch Card Machine

1801

In France, Joseph Marie Jacquard invents a loom that uses punched wooden cards to automatically weave fabric designs. Early computers would use similar punch cards.

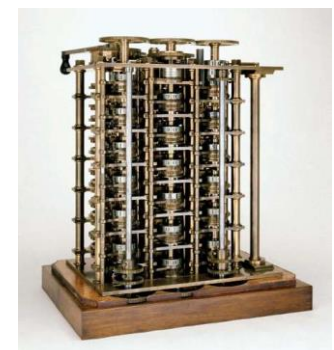


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Punch Card (1801)

1822

English mathematician Charles Babbage obtained government support for the design of a projected machine, the Difference Engine, with a 20-decimal capacity. Its construction required the development of mechanical engineering techniques, to which Babbage of necessity devoted himself.



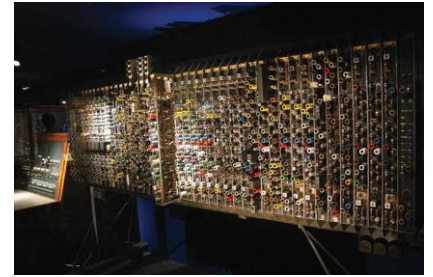
Difference Engine
(1822)

1890

Herman Hollerith designs a punch card system to calculate the 1880 census, accomplishing the task in just three years and saving the government \$5 million. He establishes a company that would ultimately become IBM.

1936

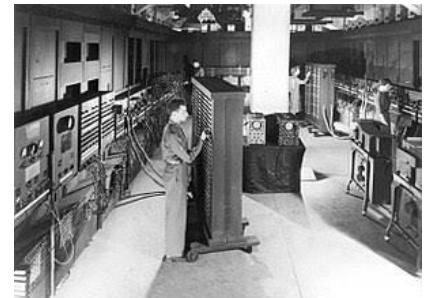
- Alan Turing presents the notion of a universal machine, later called the Turing machine, capable of computing anything that is computable. The central concept of the modern computer was based on his ideas.



Turing Machine (1936)

1937

- J.V. Atanasoff, a professor of physics and mathematics at Iowa State University, attempts to build the first computer without gears, cams, belts or shafts.



ENIAC (1943-1944)

1941

- Atanasoff and his graduate student, Clifford Berry, design a computer that can solve 29 equations simultaneously. This marks the first time a computer is able to store information on its main memory.



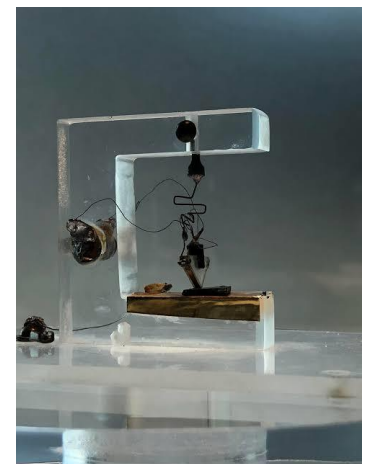
UNIVAC (1946)

1943-1944

- Two University of Pennsylvania professors, John Mauchly and J. Presper Eckert, build the Electronic Numerical Integrator and Calculator (ENIAC). Considered the grandfather of digital computers, it fills a 20-foot by 40-foot room and has 18,000 vacuum tubes.

1946

- Mauchly and Presper leave the University of Pennsylvania and receive funding from the Census Bureau to build the UNIVAC, the first commercial computer for business and government applications.



First Transistor (1947)

1947

- William Shockley, John Bardeen and Walter Brattain of Bell Laboratories invent the transistor. They discovered how to make an electric switch with solid materials and no need for a vacuum.

1958

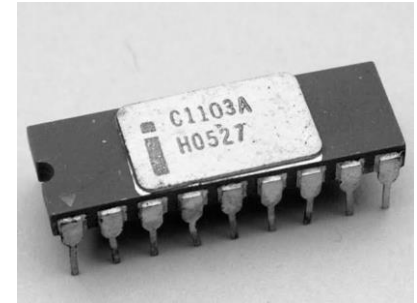
- Jack Kilby and Robert Noyce unveil the integrated circuit, known as the computer chip. Kilby was awarded the Nobel Prize in Physics in 2000 for his work.



First Chip (1958)

1964

- Douglas Engelbart shows a prototype of the modern computer, with a mouse and a graphical user interface (GUI). This marks the evolution of the computer from a specialized machine for scientists and mathematicians to technology that is more accessible to the general public.



First DRAM (1970)

1970

- The newly formed Intel unveils the Intel 1103, the first Dynamic Access Memory (DRAM) chip.



Floppy Disk (1971)

1971

- Alan Shugart leads a team of IBM engineers who invent the "floppy disk," allowing data to be shared among computers.

1973

- Robert Metcalfe, a member of the research staff for Xerox, develops Ethernet for connecting multiple computers and other hardware.



First PC (1981)

1976

- Steve Jobs and Steve Wozniak start Apple Computers on April Fool's Day and roll out the Apple I, the first computer with a single-circuit board, according to Stanford University.

1981

- The first IBM personal computer, code-named "Acorn," is introduced. It uses Microsoft's MS-DOS operating system. It has an Intel chip, two floppy disks and an optional color monitor. Sears & Roebuck and Computerland sell the machines, marking the first time a computer is available through outside distributors. It also popularizes the term PC.



First Laptop (1983)

1983

- Apple's Lisa is the first personal computer with a GUI. It also features a drop-down menu and icons. It flops but eventually evolves into the Macintosh. The Gavilan SC is the first portable computer with the familiar flip form factor and the first to be marketed as a "laptop."

1986

- Compaq brings the Deskpro 386 to market. Its 32-bit architecture provides as speed comparable to mainframes.

1990

- Tim Berners-Lee, a researcher at CERN, the high-energy physics laboratory in Geneva, develops HyperText Markup Language (HTML), giving rise to the World Wide Web.

1993

- The Pentium microprocessor advances the use of graphics and music on PCs.

1994

- PCs become gaming machines as "Command & Conquer," "Alone in the Dark 2," "Theme Park," "Magic Carpet," "Descent" and "Little Big Adventure" are among the games to hit the market.

1999

- The term Wi-Fi becomes part of the computing language and users begin connecting to the Internet without wires.

2003

- The first 64-bit processor, AMD's Athlon 64, becomes available to the consumer market.

2016

- The first reprogrammable quantum computer was created. "Until now, there hasn't been any quantum-computing platform that had the capability to program new algorithms into their system. They're usually each tailored to attack a particular algorithm," said study lead author Shantanu Debnath, a quantum physicist and optical engineer at the University of Maryland, College Park.

2017

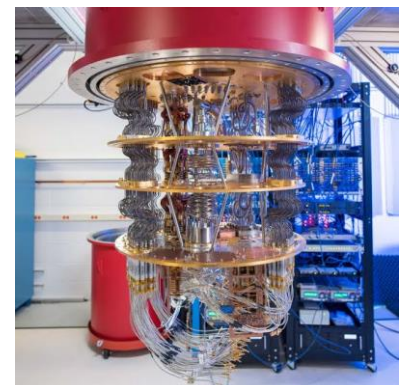
- The Defense Advanced Research Projects Agency (DARPA) is developing a new "Molecular Informatics" program that uses molecules as computers. "Chemistry offers a rich set of properties that we may be able to harness for rapid, scalable information storage and processing," Anne Fischer, program manager in DARPA's Defense Sciences Office, said in a statement. "Millions of molecules exist, and each molecule has a unique three-dimensional atomic structure as well as variables such as shape, size, or even color. This richness provides a vast design space for exploring novel and multi-value ways to encode and process data beyond the 0s and 1s of current logic-based, digital architectures."



Pentium Microprocessor
(1993)



64-bit Processor (2003)



Quantum Computer (2016)