

History of Computers

History of Computers – Key Milestones & Concepts

1. Early Foundations (Pre-20th Century)

Period	Milestone	Significance
3000?BC – 500?BC	Counting tools – abacus, tally sticks	First mechanical aids for arithmetic.
1623	Willebrord Snell's "calculating machine"	Early concept of a device that could perform repeated calculations.
1642	Blaise Pascal – Pascaline	First mechanical calculator capable of addition and subtraction.
1672	Gottfried Wilhelm Leibniz – Stepped Reckoner	Introduced the stepped drum, enabling multiplication/division.
1801	Joseph Marie Jacquard – Jacquard loom	Used punched cards to control patterns; inspired later data-programming ideas.
1822	Charles Babbage – Difference Engine (concept)	Designed to compute polynomial tables automatically.
1837	Babbage – Analytical Engine	First design for a programmable, general-purpose computer (had a "store" and "mill").
1843	Ada Lovelace – Notes on the Analytical Engine	Recognized the machine's potential beyond calculation; wrote the first algorithm.

2. The Electromechanical Era (1930s-1940s)

Year	Machine	Technology	Impact
1936	Alan Turing – "Turing Machine" (theoretical)	Abstract model of computation.	Basis for modern computer science theory.
1937	Konrad Zuse – Z1	Binary, electromechanical relays.	First fully binary, programmable computer.

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Year	Machine	Technology	Impact
1939	Harvard Mark I (IBM) – “IBM Automatic Sequence Controlled Calculator”	Electromechanical, 50?kHz relays.	First large?scale automatic calculator used for WWII calculations.
1941	Zuse – Z3	Electromechanical relays, binary floating?point.	First functional programmable digital computer.
1943? 1944	Colossus (British)	Vacuum tubes, photomultiplier tubes.	First electronic, programmable machine; broke Lorenz cipher.
1944? 1945	ENIAC (U.S.)	18,000 vacuum tubes, decimal arithmetic.	First high?speed electronic general?purpose computer; 30?kIPS.
1946	EDVAC	Stored?program architecture (von Neumann).	Introduced the “program stored in memory” concept.

3. First Generation (1940s?1956) – Vacuum Tubes

- **Characteristics**

- Large, power?hungry, unreliable (tubes burn out).
- Used punched cards or paper tape for I/O.
- Programming in machine code or early assembly languages.

- **Notable Machines**

- **UNIVAC I** (1951) – First commercial computer; used for the 1952 U.S. Census.
- **IBM 701** (1952) – IBM’s first scientific computer.

- **Key Developments**

- **Assembly language** (e.g., IBM 704).
- Early high?level language **FORTRAN** (1957, just after first?gen era).

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4. Second Generation (1956?196