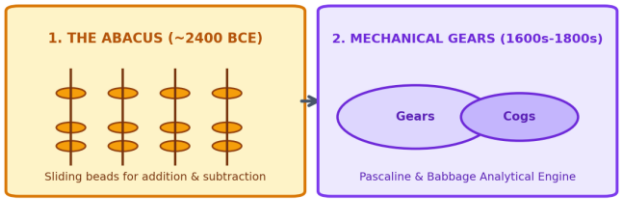
HISTORY & EVOLUTION OF COMPUTERS

Computing began thousands of years ago with wooden beads on wires. Step by step, humans invented clockwork gears, glowing glass tubes, tiny microchips, and now smart AI machines that can learn and think!

Early Calculating: Counting Frames & Mechanical Gears

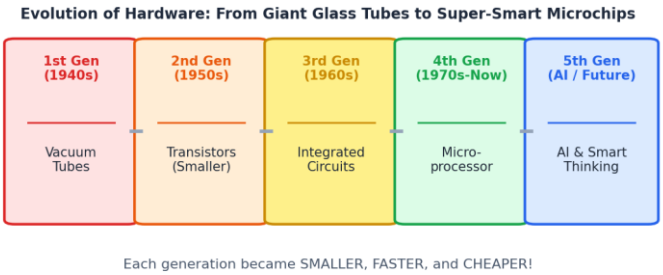
- **The Abacus (~2400 BCE):** The earliest counting frame using beads on rods to add, subtract, and track market trade.
- **Mechanical Gears (1600s - 1800s):** Blaise Pascal invented the Pascaline with interlocking gears. Charles Babbage later designed the Analytical Engine (the grandfather of all computers) with memory and a processing unit!



Manual Counting -> Clockwork Mechanical Gears

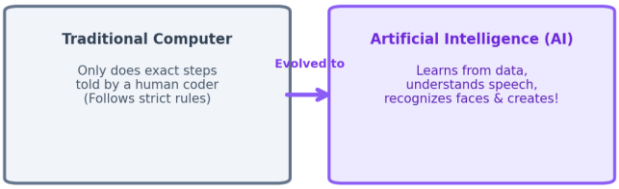
The Five Generations of Electronic Computers

- **1st Generation (1940 - 1956) [Vacuum Tubes]:** Computers filled entire rooms! They used thousands of hot, glowing glass vacuum tubes that burned out often (e.g., ENIAC).
- **2nd Generation (1956 - 1963) [Transistors]:** Replaced fragile tubes with tiny transistors. Computers became faster, smaller, and cooler (e.g., IBM 7094).
- **3rd Generation (1964 - 1971) [Integrated Circuits - ICs]:** Packed hundreds of transistors onto small silicon 'chips'. Keyboard and screen monitors appeared for the first time! (e.g., IBM System/360).
- **4th Generation (1971 - Present) [Microprocessors]:** An entire computer brain squeezed onto ONE single microchip. Gave birth to home PCs, laptops, and smartphones!
- **5th Generation (Present & Beyond) [Artificial Intelligence]:** Computers powered by smart neural networks that can recognize voices, learn from examples, and solve problems like human helpers.



Modern Era: Artificial Intelligence (AI)

Traditional computers only follow exact lines of pre-written code. **AI systems** are different: they learn from millions of examples, recognize faces, understand speech, generate art, and adapt on their own!



5th Gen: Computers that can learn, adapt, and reason like human helpers!

Quick Generation Memory Table

Generation	Main Technology	Key Feature / Example
1st Gen (1940s)	Vacuum Tubes	Huge room-sized machines, very hot (ENIAC).
2nd Gen (1950s)	Transistors	Smaller, faster, used less power.
3rd Gen (1960s)	Integrated Circuits (ICs)	Keyboard & monitor screens introduced.
4th Gen (1970s-Now)	Microprocessor	Personal computers, laptops, smartphones.
5th Gen (AI Era)	Smart Neural Networks & AI	Voice recognition, self-driving cars, robotics.