IINTELLIGENZA ARTIFICIALE E MANAGERIALE

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The Long Road to AI

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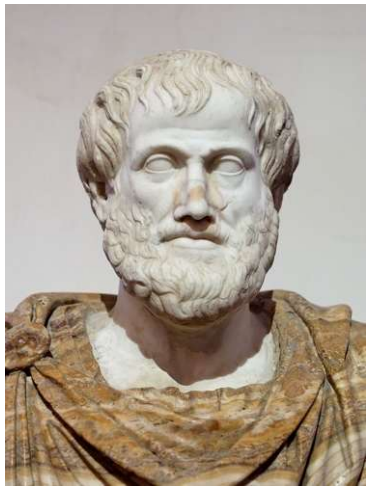
Fathers of formal reasoning

Artificial intelligence is based on the assumption that the process of human thought can be mechanized.

The study of mechanical—or "formal"—reasoning has a long history.



Aristotle

↓

Syllogism

Euclid

↓

Elements

al-Khwarizmi

↓

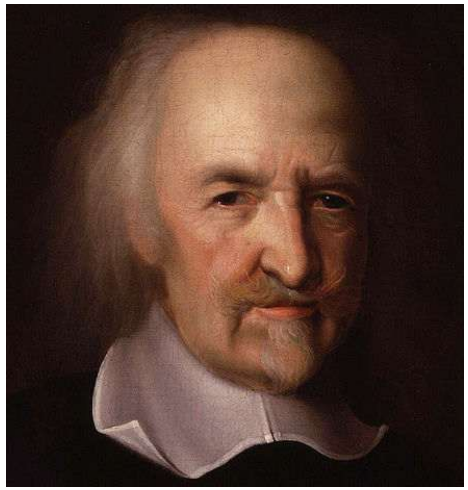
Algebra, Algorithm

All is Reckoning (ogni cosa si può calcolare)

In the 17th century, Leibniz, Thomas Hobbes and René Descartes explored the possibility that all rational thought could be made as systematic as algebra or geometry.

- Hobbes famously wrote in Leviathan: "*reason is nothing but reckoning*".
- Leibniz envisioned a universal language of reasoning (his *characteristica universalis*) which would reduce argumentation to calculation…"*Let us calculate.*"

Leibniz



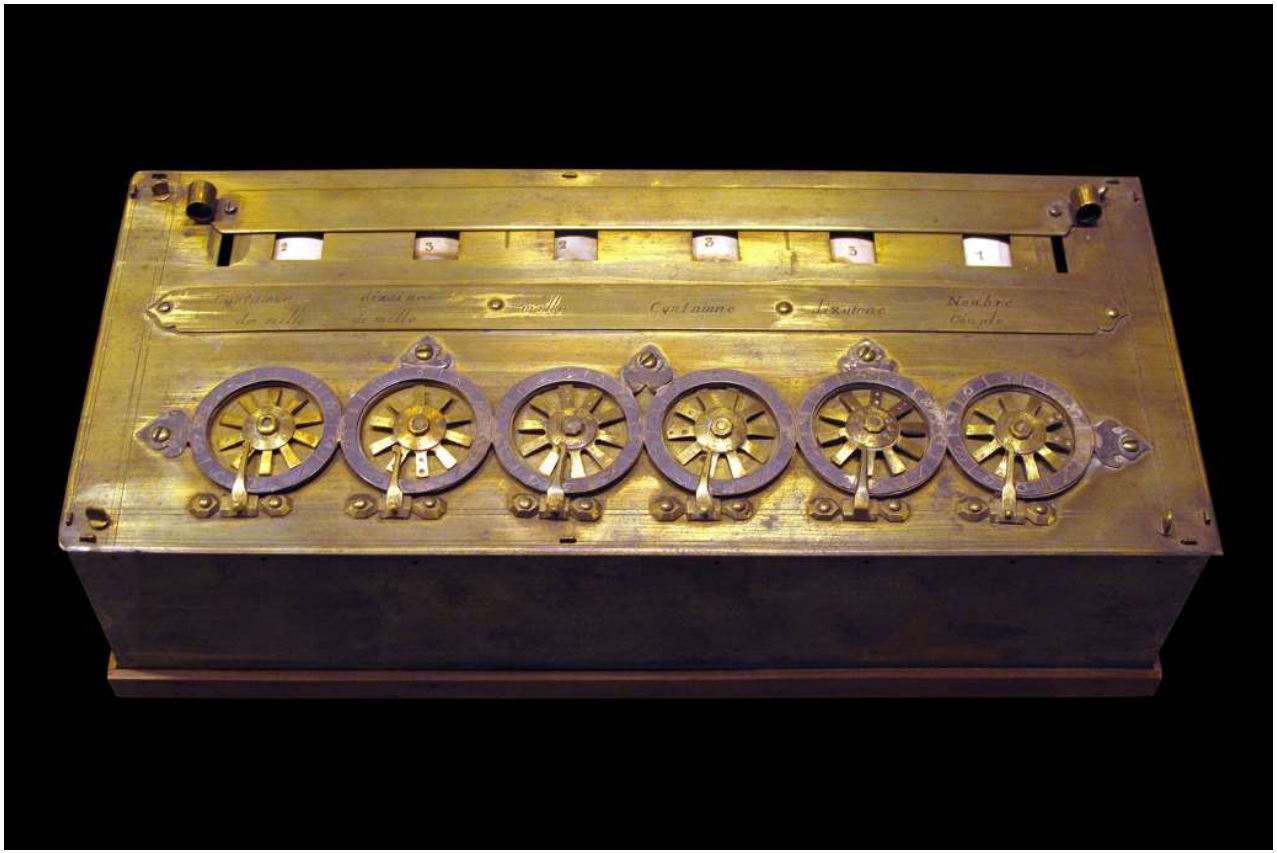
Hobbes

Descartes

3

The Pascaline

He designed the machine to add and subtract two numbers directly and to perform multiplication and division through repeated addition or subtraction.



The major breakthroughs of 19th and 20th centuries

In the 20th century, the study of mathematical logic provided the essential breakthrough that made artificial intelligence seem plausible.

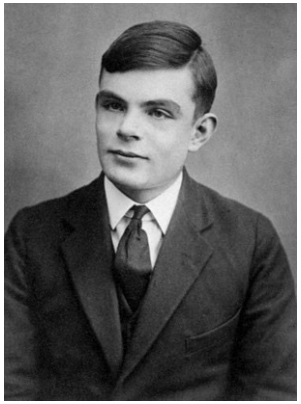
David Hilbert challenged mathematicians of the 1920s and 30s to answer this fundamental question: **"can all of mathematical reasoning be formalized?".**

His question was answered by **Gödel's incompleteness proof and Turing's machine.**

Boole

Russell

Gödel



Turing

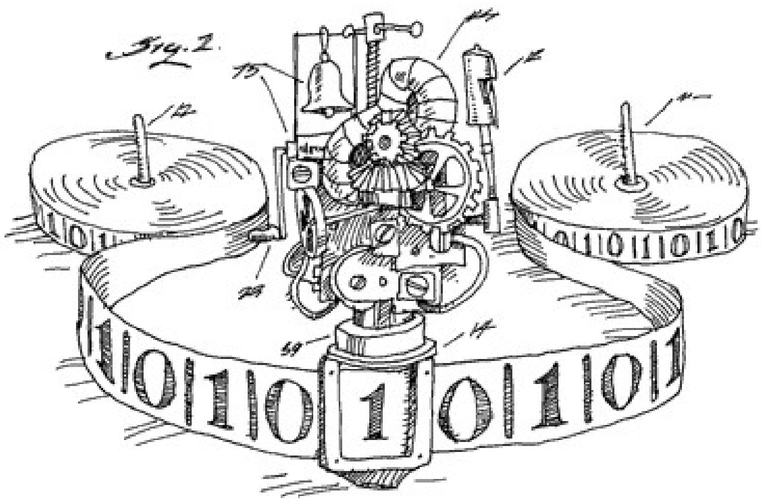
5

The Turing machine

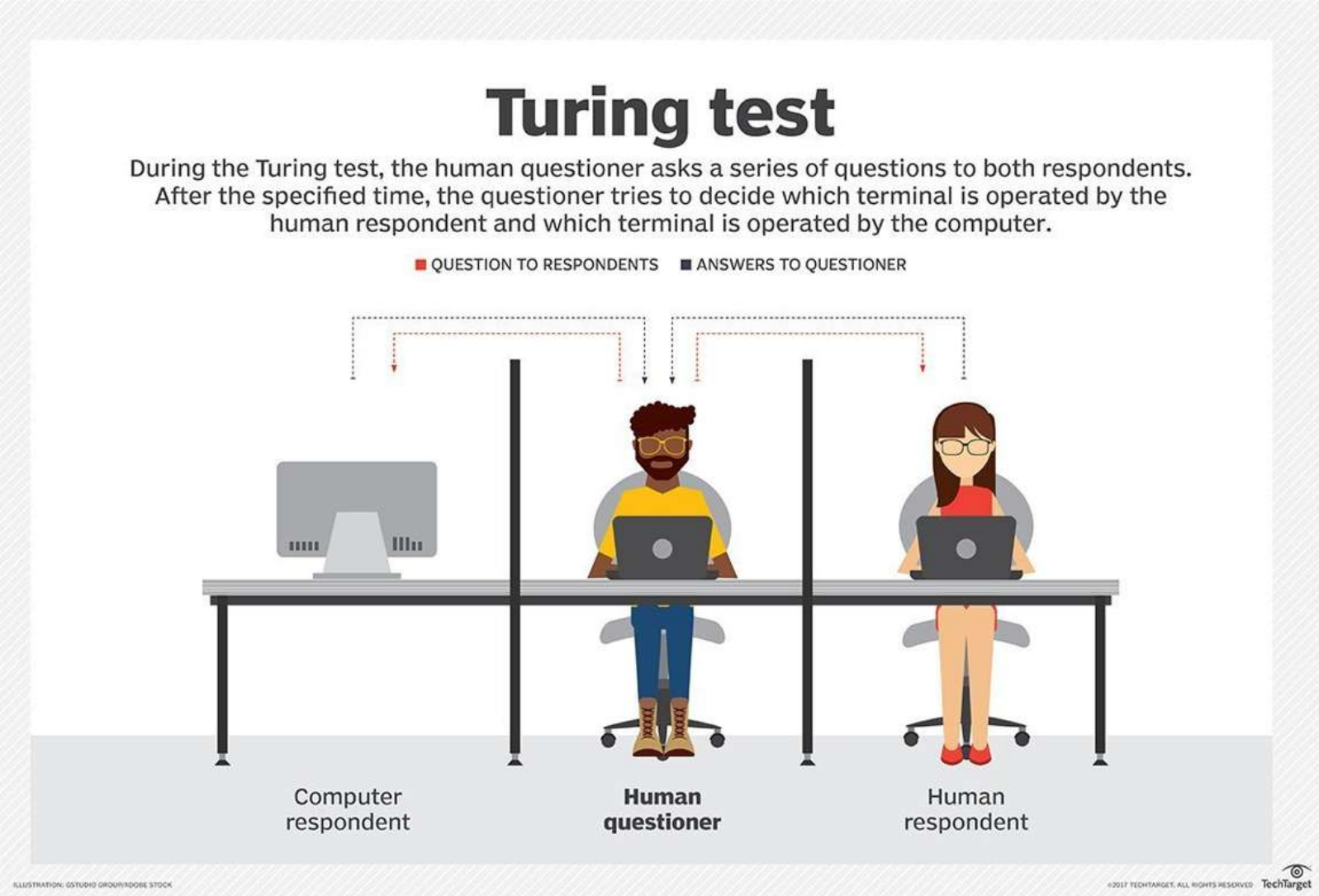
The answer provided by Gödel and Turing was surprising in two ways.

First, they proved that **there were, in fact, limits to what mathematical logic could accomplish**. But second their work suggested that, within these limits, *any form of mathematical reasoning could be mechanized*.

The key insight was the **Turing machine**, a simple theoretical construct that captured the essence of abstract symbol manipulation. This invention would inspire a handful of scientists to begin discussing the possibility of thinking machines.



The Turing test



Quali abilità cognitive serviranno a voi, guidatori umani, per comprendere questa situazione?

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Cosa sono davvero le allucinazioni?

(E perchè le chiamiamo cosi?)

cosa vedi nella foto?

La foto in bianco e nero mostra una scena urbana, probabilmente in una città statunitense, dove una donna è intenta a svolgere più azioni contemporaneamente:

- Sta parlando al telefono.
- Spinge un passeggino con un bambino seduto.
- Tiene al guinzaglio un cane, che si trova sul marciapiede ad annusare per terra.

Accanto a lei c'è un uomo che sembra accompagnarla e osserva la scena. Sullo sfondo si vedono automobili parcheggiate e attività commerciali (come "Cine..." e "La Cara"), oltre ad alcuni pedoni che attraversano la strada.

L'immagine comunica un senso di quotidianità cittadina, con un pizzico di caos gestionale dato dalle molte attività che la donna sta cercando di portare avanti tutte insieme. Vuoi che analizzi qualche dettaglio in particolare?

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Grazie
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