


Изчислимост (но накратко!)

Атанас Семерджиев






1

(Какво всъщност НЕ Е) Математиката



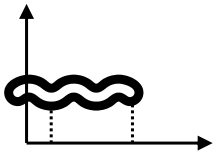
Ей мъ на
и мен!

	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	8	12
4	4	8	12	

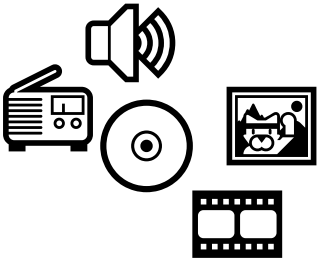


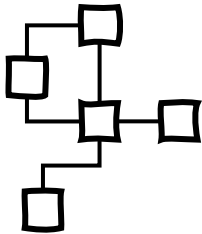
$$a^2 + b^2 = c^2$$

2

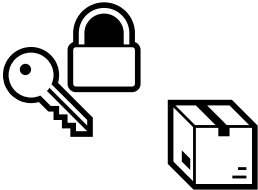



Математически анализ






Висша алгебра





Теория на вероятностите /
Математическа статистика



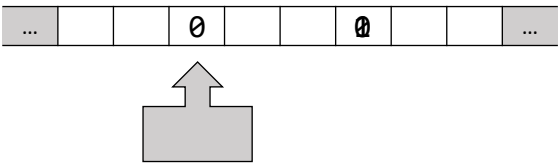
3

S – безкрайно множество

$$\sum_{i \in S} 1$$


$$a^2 + b^2 = c^2$$

4

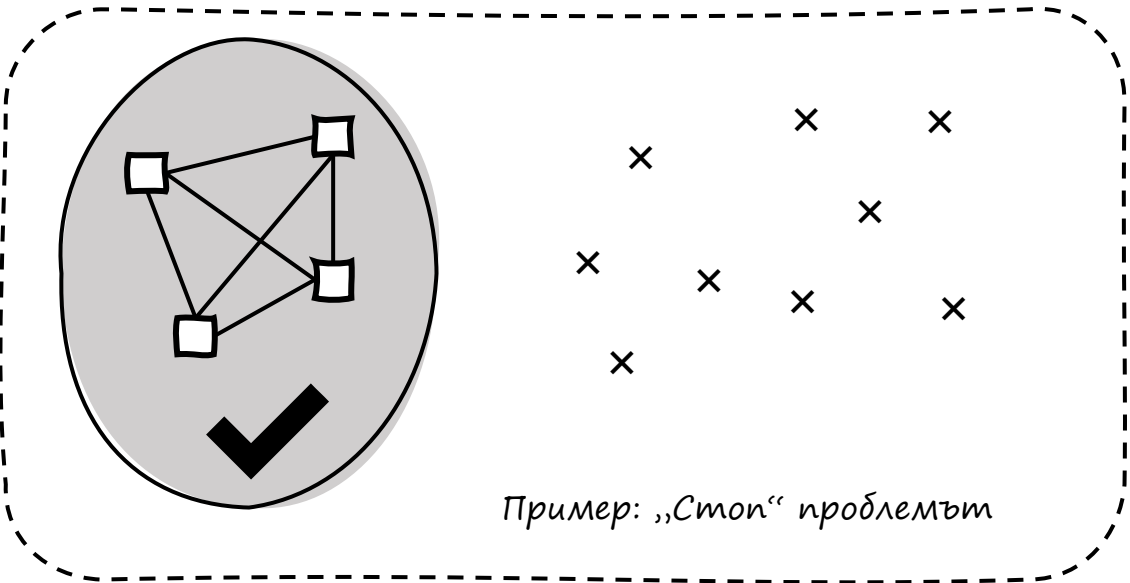


Машины на Тюринг
Машины с неограничени регистри
и др.

+k: k-пъти повтаряме +1
*m: m-пъти повтаряме +k
и т.н.

Ламбда смятане
Рекурсивни функции
Формален извод
и др.

5



Пример: „Стоп“ проблемът

6



Джон фон Нойман
(1903 – 1957)



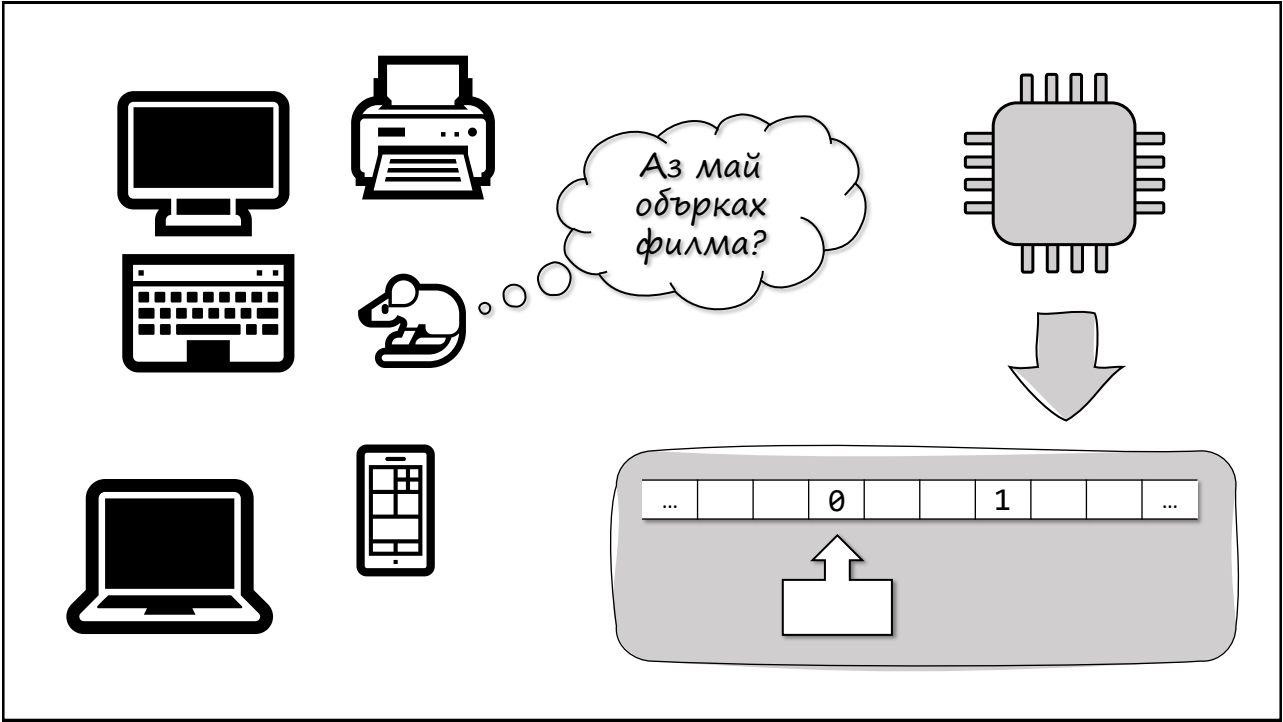
Джон Атанасов
(1903 – 1995)



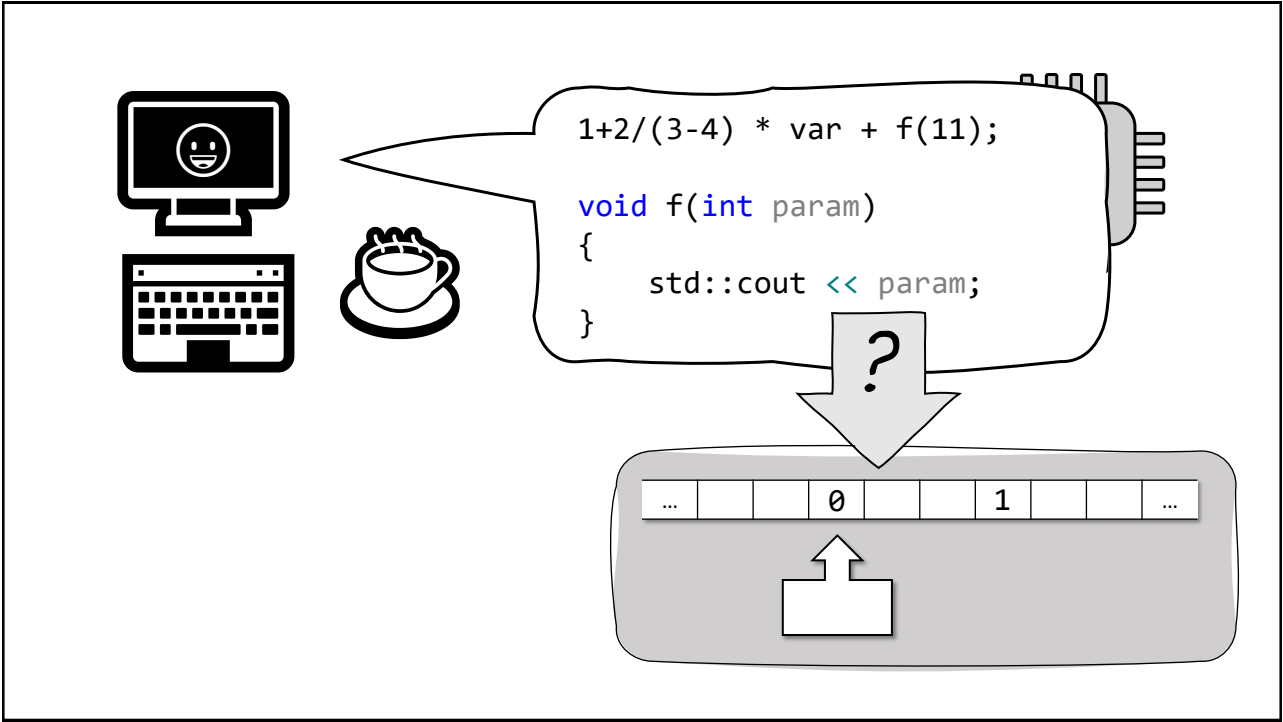
Алърн Тюринг
(1912 – 1954)

* Източник на изображенията: Уикипедия

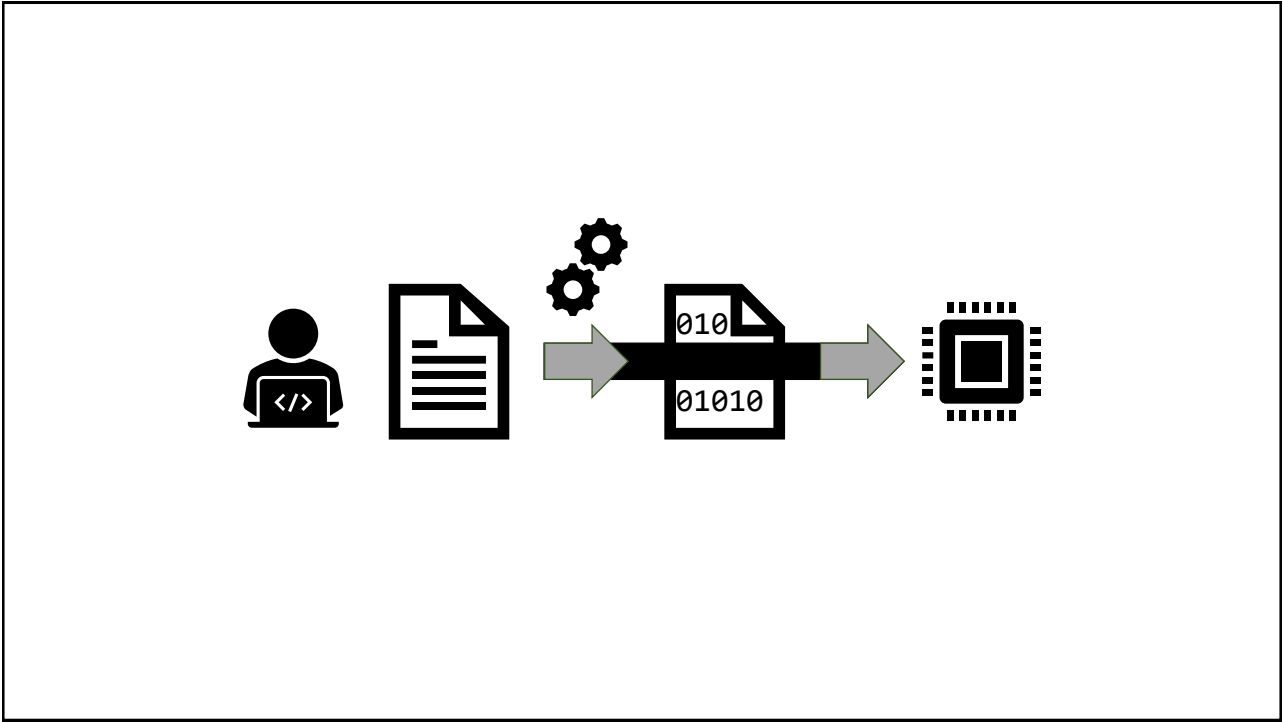
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8



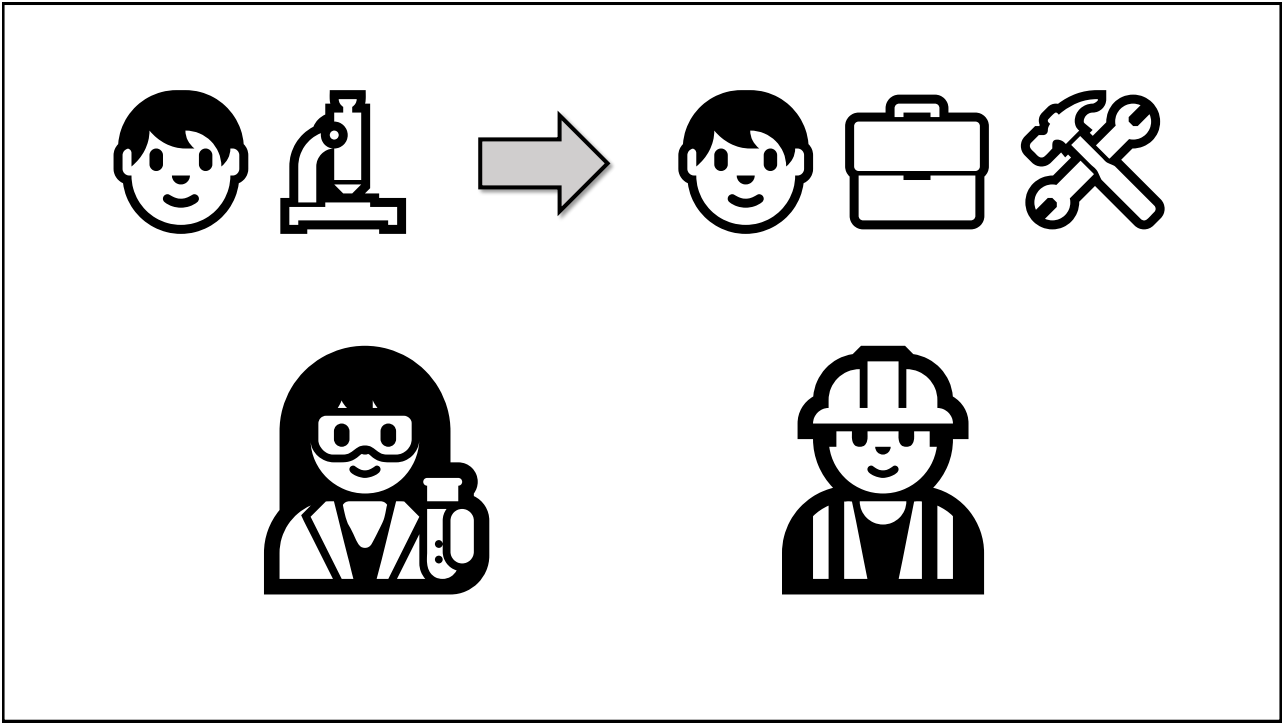
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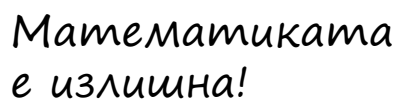
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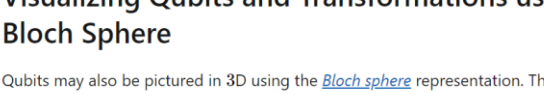
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Visualizing Qubits and Transformations using the Bloch Sphere

Qubits may also be pictured in 3D using the [Bloch sphere](#) representation. The Bloch sphere gives a way of describing a single-qubit quantum state (which is a two-dimensional complex vector) as a three-dimensional real-valued vector. This is important because it allows us to visualize single-qubit states and thereby develop reasoning that can be invaluable in understanding multi-qubit states (where sadly the Bloch sphere representation breaks down). The Bloch sphere can be visualized as follows:



The following notation is often used to describe the state of a qubit after a Hadamard gate to $|0\rangle$ and $|1\rangle$ (which correspond to the up and down directions on the Bloch sphere):

$$\frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ 1 \end{bmatrix} = H|0\rangle = |+\rangle, \quad \frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ -1 \end{bmatrix} = H|1\rangle = |-\rangle,$$

These states can also be expanded using Dirac notation as sums of $|0\rangle$ and $|1\rangle$:

$$|+\rangle = \frac{1}{\sqrt{2}}(|0\rangle + |1\rangle), \quad |-\rangle = \frac{1}{\sqrt{2}}(|0\rangle - |1\rangle).$$

$x_a - x_a!$

14



15