"Wir müssen wissen! Wir werden wissen!"

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Introduction

- Tiny Bug of a Golden Century: Y2K
- Something's Happening to Mathematics!
- "There is no *ignorabimus*!"

Aha! We invented the "Computing Machine"!

- Babbage should be happy now..

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- Babbage should be happy now..
- Here comes the ACM!

A Long Night

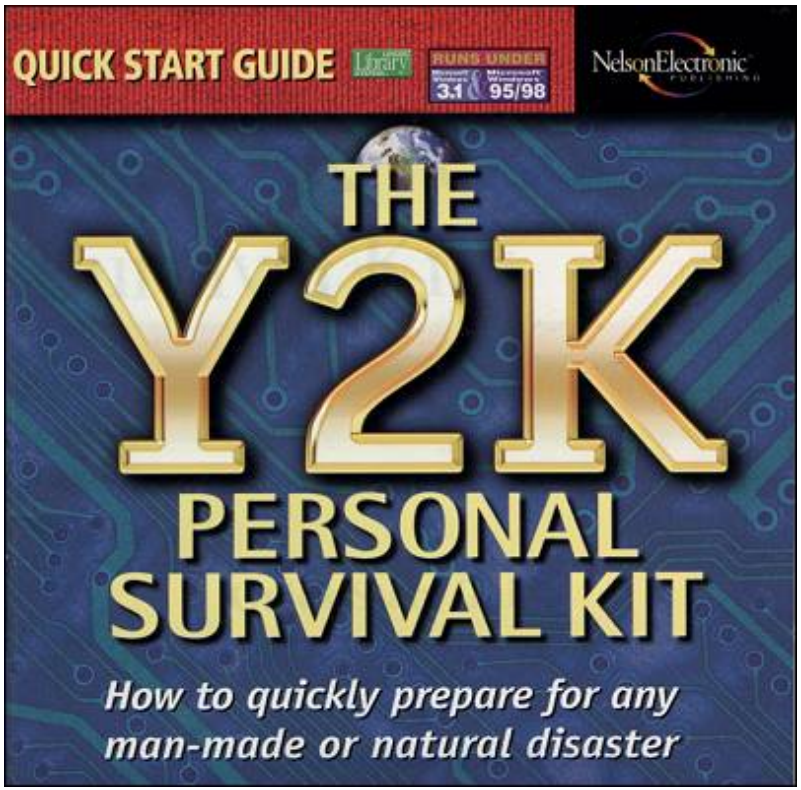
- Millenium!

A Long Night

- Millenium!
- Oops! Computers cannot count!

Y2K Bug

A digital disaster. The end of the world?



Y2K Bug

Say hello to your brand new word processor!

Y2K Bug

And how Gates survived:

He bought a Macintosh (- :

Golden Years of Science: 19th Century

Rise of The Scientific Developments!

Golden Years of Science: 19th Century

Say hello to The Lord Kelvin guys!

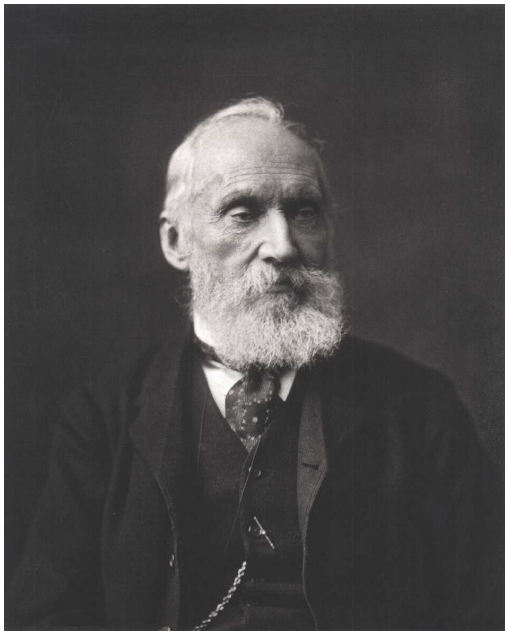


Figure: Kelvin, Lord William Thomson (1824 - 1907)

Something's Happening to Mathematics!

Euclid has something to say:

Axioms from The Elements

5 Famous Postulates from 300 BCE

1. To draw a straight line from any point to any point.
2. To produce a finite straight line continuously in a straight line.
3. To describe a circle with any center and radius.
4. That all right angles equal one another.
5. That, if a straight line falling on two straight lines makes the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which are the angles less than the two right angles.

The 5th One!

Can it really be derived from the other four?

The 5th One!

Can it really be derived from the other four?
What about consistency?

Different Era, Different Approach

reductio ad absurdum!

- Assume something contrary to the fifth postulate,
- Derive the theorems,
- In the end, face the contradiction.

Different Era, Different Approach

Celebrities here:

Figure: Johann Bolyai (1802-1860)

Figure: Nicholai Ivanovitch Lobachevsky (1792-1856)

Different Era, Different Approach

A familiar face:

Figure: Carl Friedrich Gauss (1777-1855)

Strange Results

Contrary assumptions didn't result in contradictions, instead:

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Strange Results

Contrary assumptions didn't result in contradictions, instead:
New Universes!
But which one is the "real world"?
Liberate the axioms from the real world!

Our Grandfather

"One must be able to say at all times -instead of points, straight lines, planes- tables, chairs and beer mugs."

Figure: David Hilbert (1862-1943)

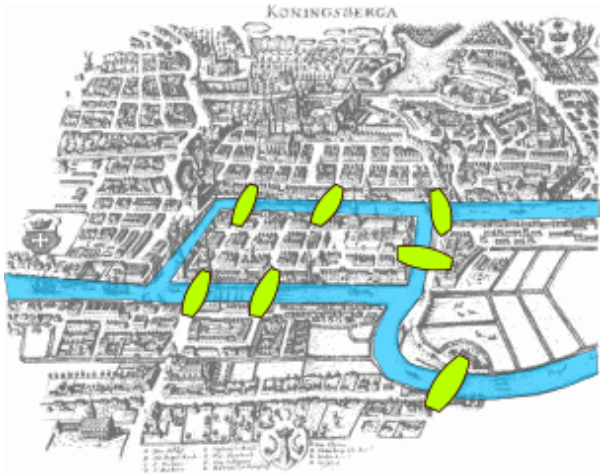
David Hilbert

Born near Königsberg:

David Hilbert

Born near Königsberg

Pregel River:



Leonhard Euler (1707-1783)

Hilbert's Talk

He gave a major address at the Second International Congress of Mathematics, in Paris in August 1900

Hilbert's Talk

Famous words from a master: *However unapproachable these problems may seeö to us and however helpless we stand before them, we have, nevertheless, the firm conviction that their solution must follow by a finite number of purely logical processes... This conviction of the solvability of every mathematical problem is a powerful incentive to the worker. We hear within us the perpetual call: There is the problem. Seek its solution. You can find it by pure reason, for in mathematics there is no* **ignorabimus!** *We must know! We shall know!*

Conclusion

Wir müssen wissen! Wir werden wissen!

Reference

Go and read this book:
The Annotated Turing by *Charles Petzold*