

Introduction to Software Engineering

Software Systems – Design – L1T1

Dr. Vadim Zaytsev aka @grammarware, November 2020

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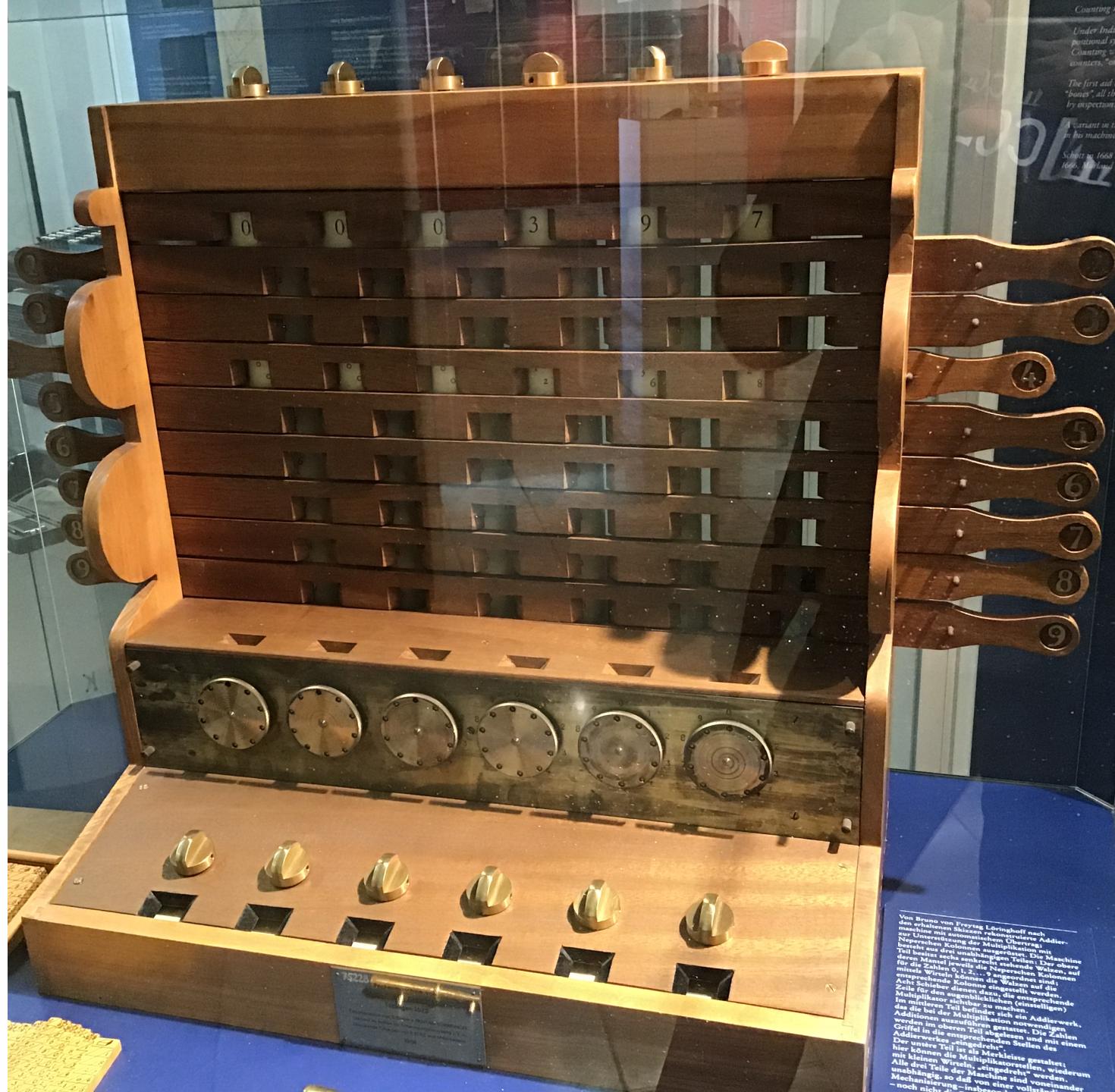
Fm
Formal
Methods
& Tools



1642

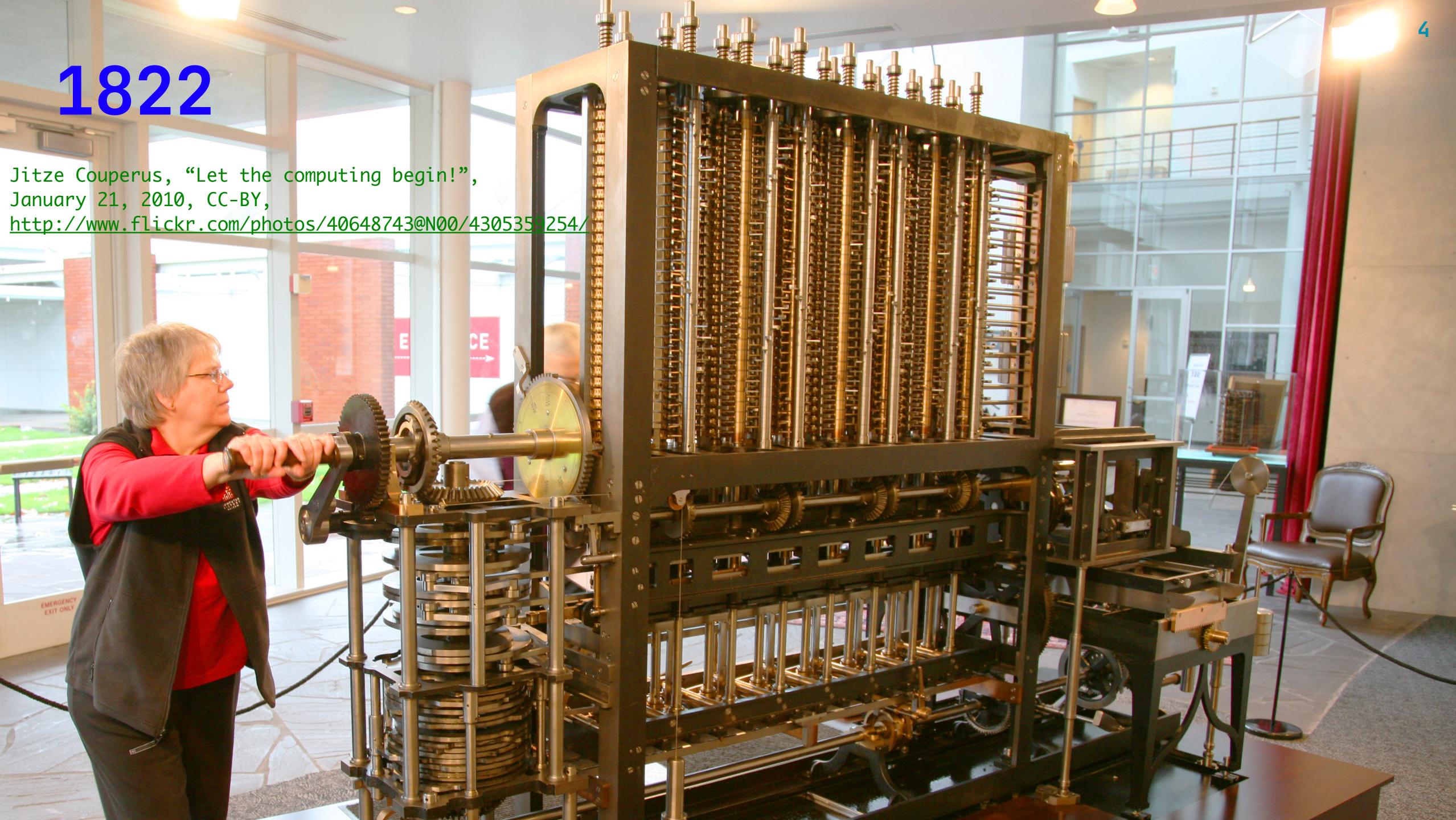


1623

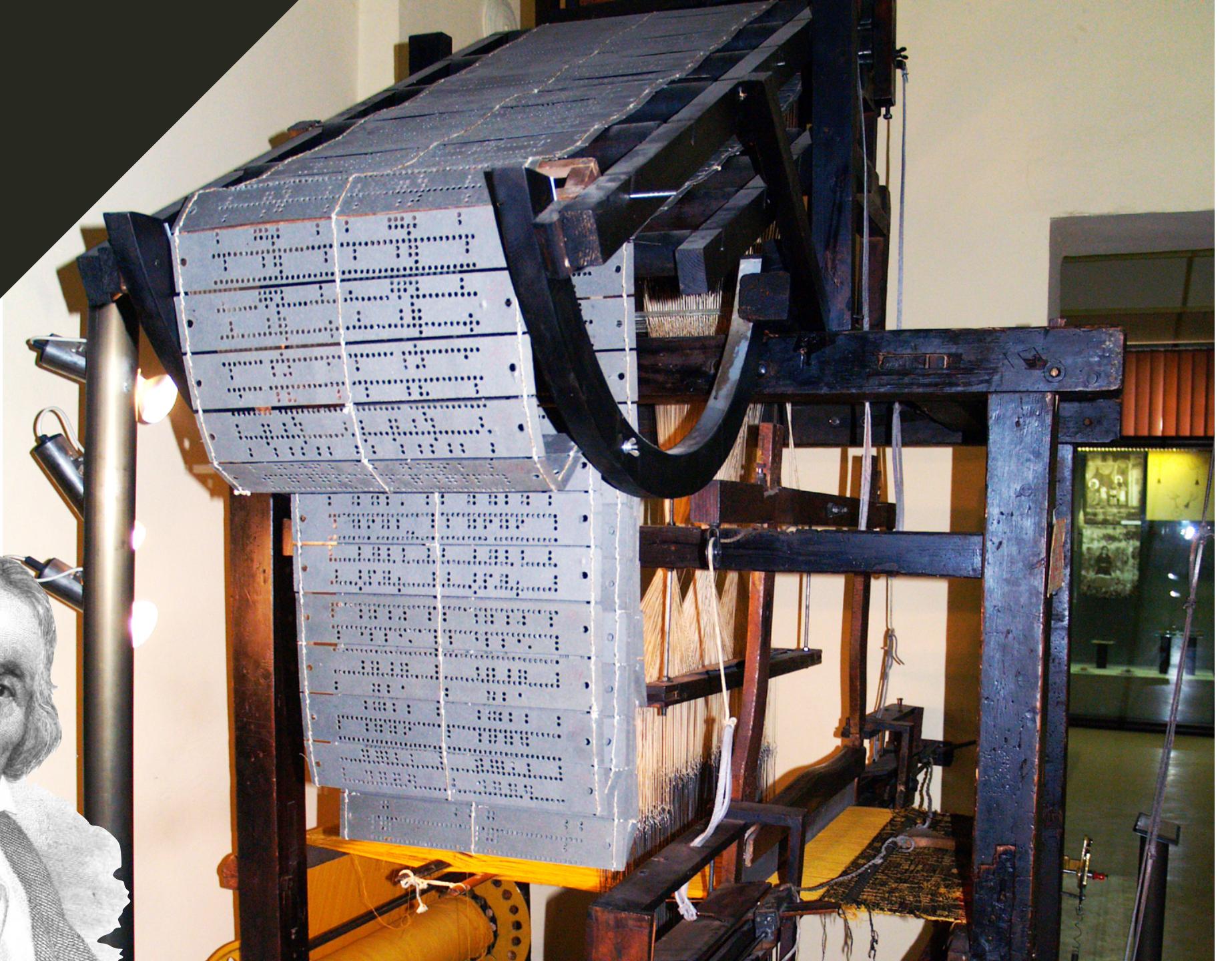


1822

Jitze Couperus, "Let the computing begin!",
January 21, 2010, CC-BY,
<http://www.flickr.com/photos/40648743@N00/4305359254/>



1805



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Edouard-Léon Léfèvre, CC-BY-SA,
[https://commons.wikimedia.org/wiki/
File:Hand-driven-jacquard-loom.jpg](https://commons.wikimedia.org/wiki/File:Hand-driven-jacquard-loom.jpg)

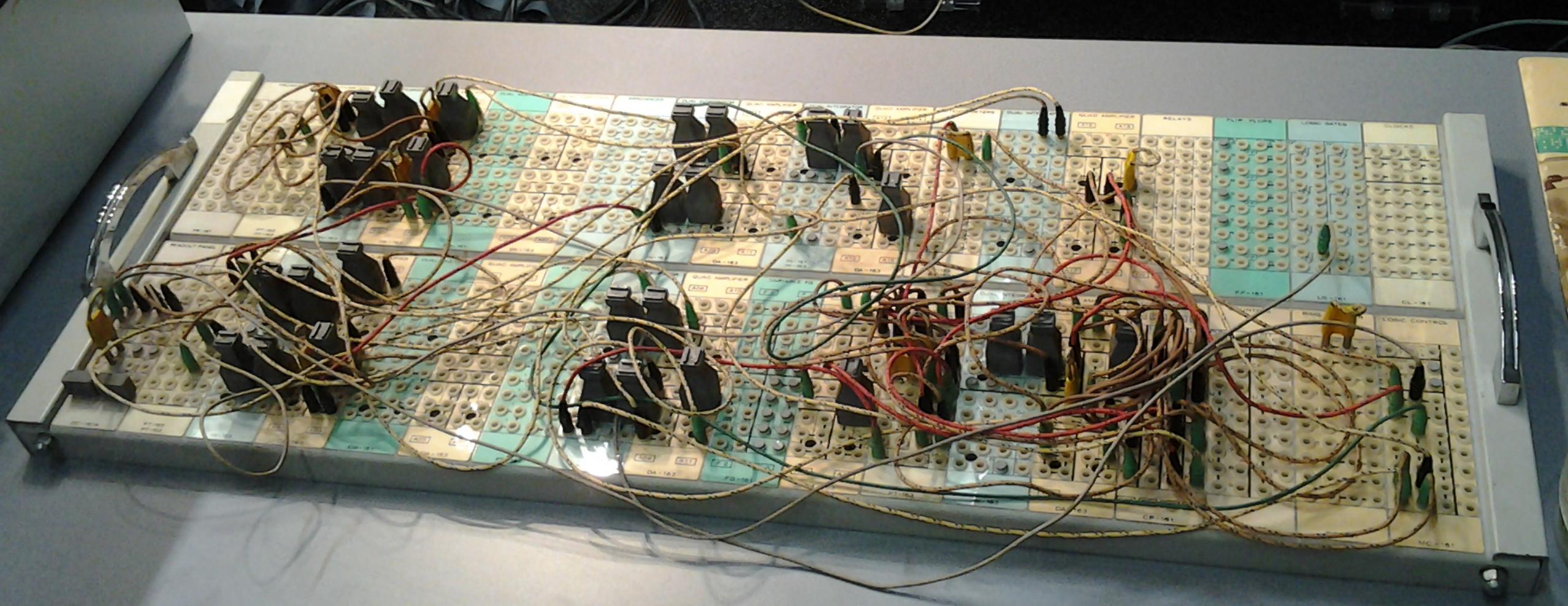
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1946





12

13. 'Bollenveld'

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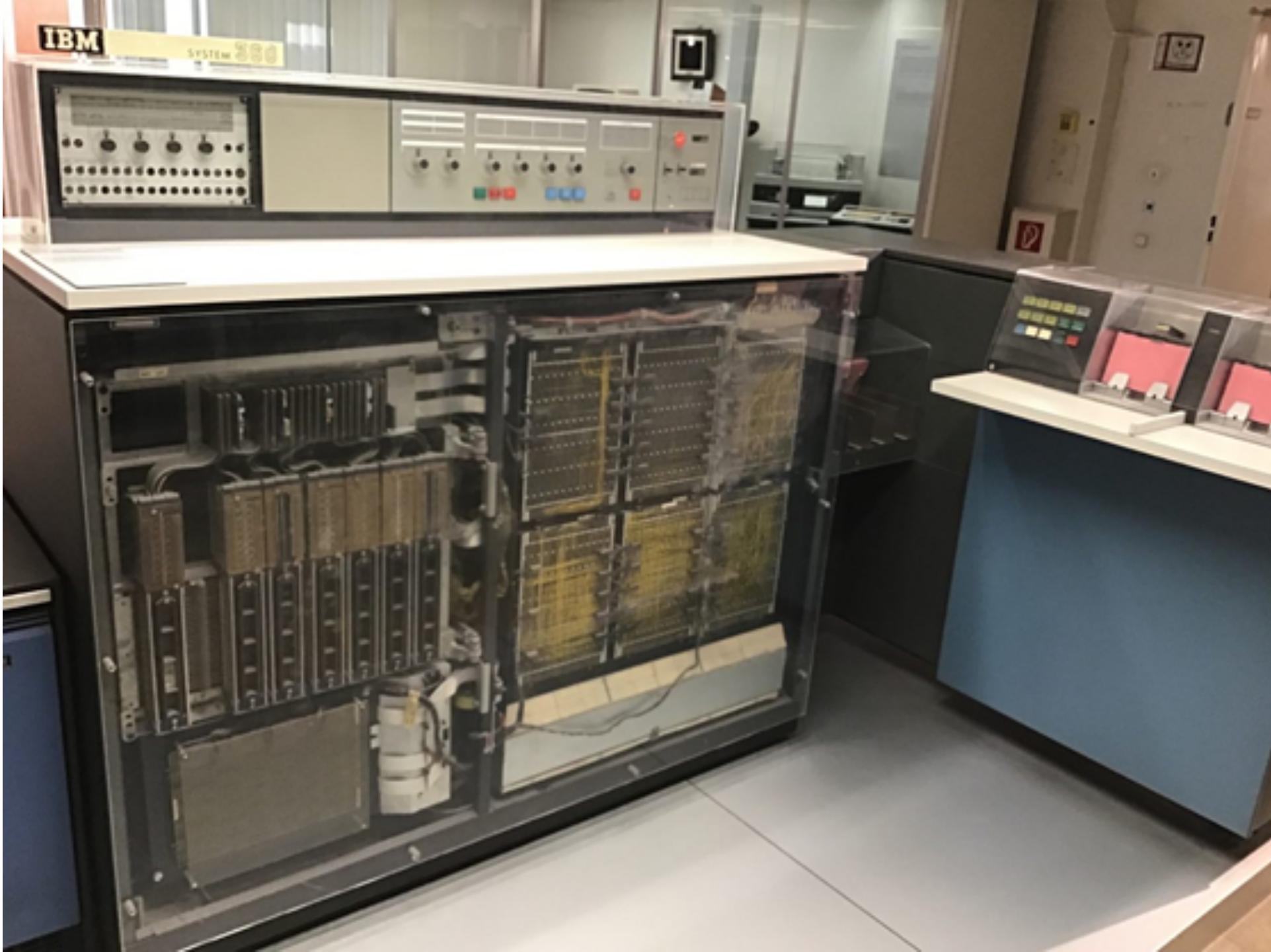
1957

photo credit: <http://techie.com/amazing-grace/> / personal.psu.edu



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1964

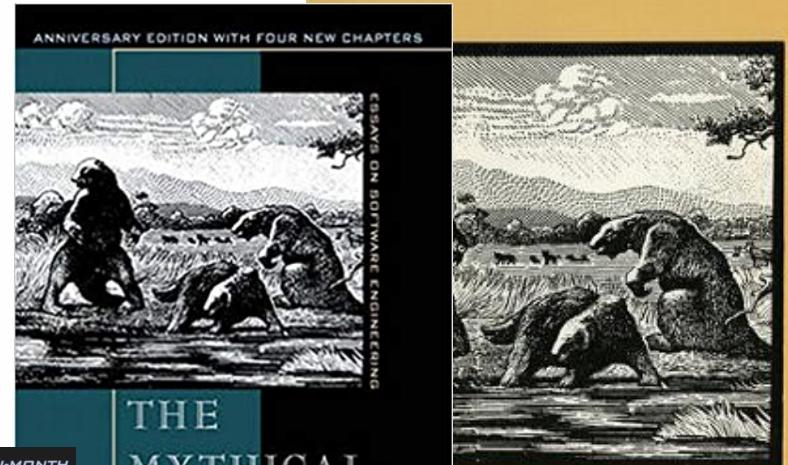


Making software in the 1960s

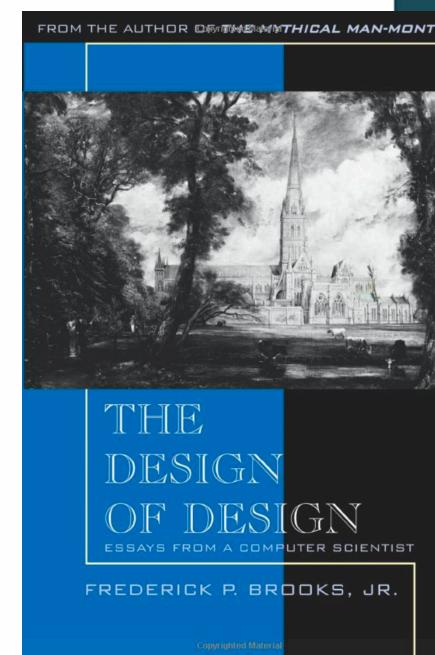
- Completed code always has **defects**
- Coding should be finished **quickly**
- Deadline? Add people!
- “**Design as you code**”

the
mythical
man-month

Essays on Software Engineering



Frederick P. Brooks, Jr.



Software Crisis

Figure 2

"Software development has calendar overrun."

<u>Response</u>	<u>Respondents</u>	
	<u>Number</u>	<u>Percentage</u>
Very common	34	30.1
Fairly common	36	31.9
Not very common	29	25.7
Very rare	9	8.0
Never occurs	2	1.8
Don't know	<u>3</u>	<u>2.7</u>
 Total	<u>113</u>	<u>a/ 100.0</u>

a/Does not add due to rounding

Software Crisis

Figure 3

Figu
"Sof
R
Very
Fair
Not
Very
Neve
Don'

"The delivered software must be corrected or modified by in-house programmers before it is usable."

<u>Response</u>	<u>Number</u>	<u>Respondents</u>	<u>Percentage</u>
Very common	10		8.8
Fairly common	39		34.5
Not very common	40		35.4
Very rare	15		13.3
Never occurs	7		6.2
Don't know	2		1.8
Total	<u><u>113</u></u>		<u><u>100.0</u></u>

a/Does not add due to rounding

Software Engineering was born

SOFTWARE ENGINEERING

Report on a conference sponsored by the

NATO SCIENCE COMMITTEE

Garmisch, Germany, 7th to 11th October 1968

Chairman: Professor Dr. F. L. Bauer

Co-chairmen: Professor L. Bolliet, Dr. H. J. Helms

Editors: Peter Naur and Brian Randell

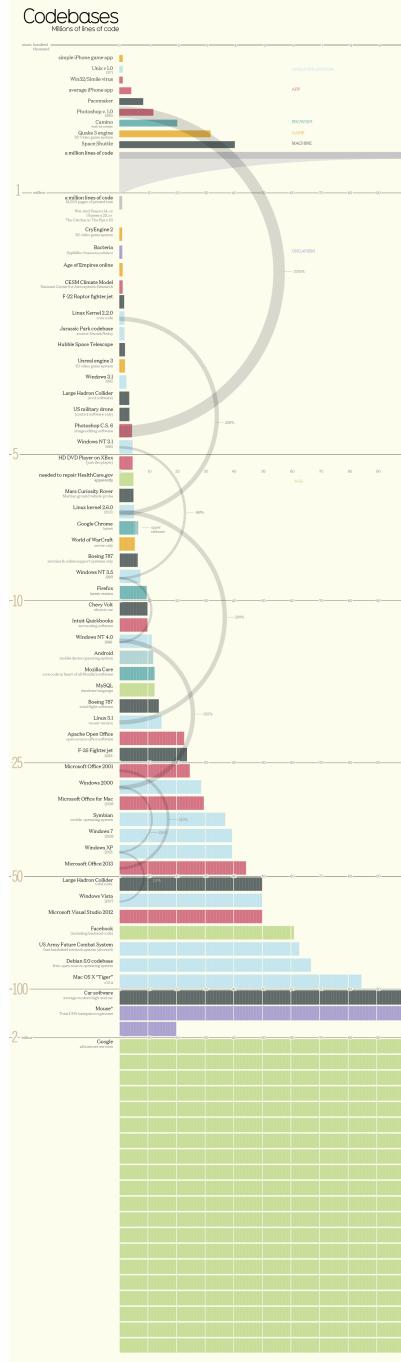
January 1969



130273
Lines
of
Code

<https://github.com/chrislgarry/Apollo-11/>

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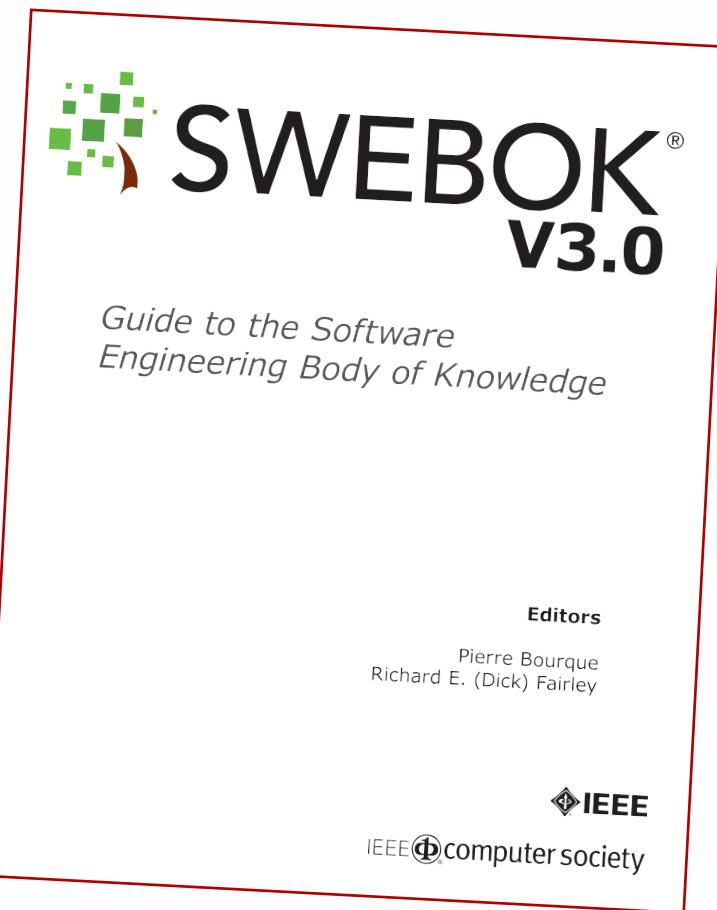
Jeff Desjardins, How Many Millions of Lines of Code Does It Take?, 2017
<https://www.visualcapitalist.com/millions-lines-of-code/>

16



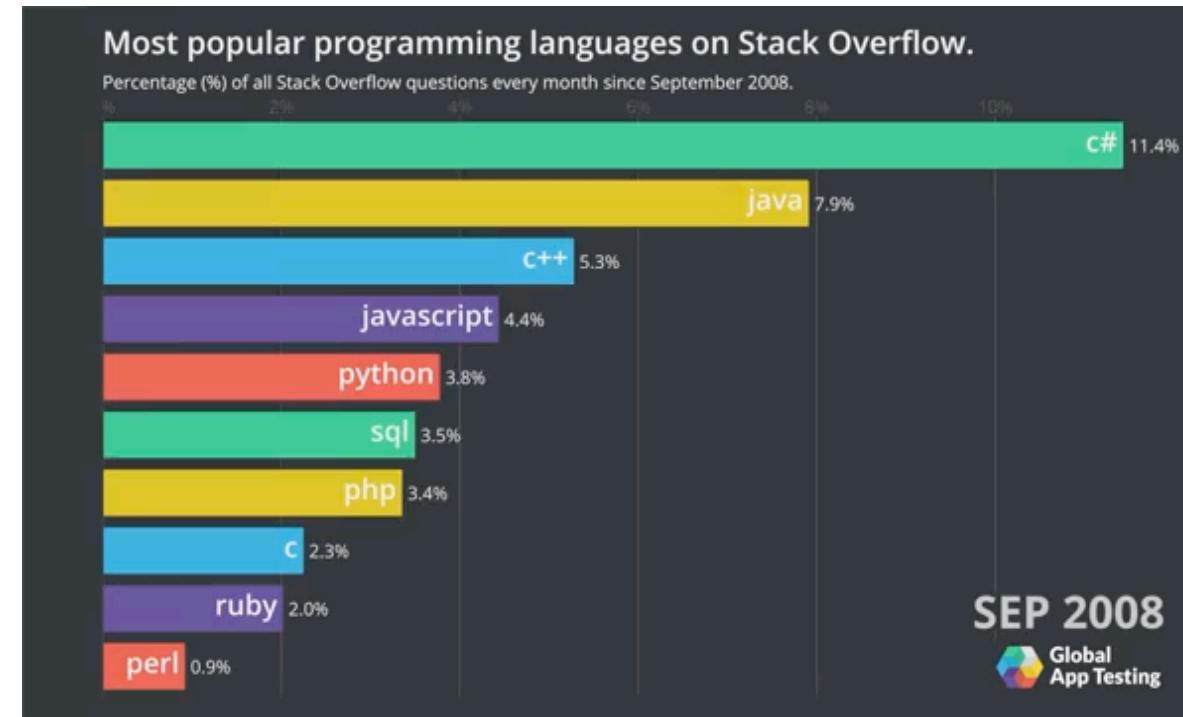
Software Engineering BoK

- Software Requirements
- Software Design
- Software Construction
- Software Testing
- Software Maintenance
- Software Configuration Management
- Software Engineering Management
- Software Engineering Process
- Software Engineering Models & Methods
- ...



Conclusion

- Computing dates back to 16xx
- Programs are separate since 18xx
- Programming languages since 195x
- Software engineering since 197x
- Next: SE phases & design
- Questions? Ask!



Topics/slides Disclaimer

- Good ✓

- watch before Q&A
- embrace reality
- try out at labs
- ask for feedback
- apply to project
- dig deeper
- recall from slides

- Bad ✗

- slides over videos
- assumptions
- blanks
- timing

