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2. Computing Machines

1946: John von Neumann

He was regarded as having perhaps the widest coverage of any mathematician of his time and was said to have been "the last representative of the great mathematicians who were equally at home in both pure and applied mathematics".
[Wikipedia](#)

He took the specification of the TM (specifically the universal TM) and designed a real-life version out of vacuum tubes. The system was called Electronic Discrete Variable Automatic Computer (EDVAC).

EDVAC

- The von Neumann architecture was born.
    - CPU
    - Memory
    - Data bus

- The same architecture is still used by all major processor designs.

- A machine code instruction set was first introduced.

- EDVAC is programmable.

- EDVAC is based on binary encoding of data.

# 1953: John Backus - the birth of structured programming
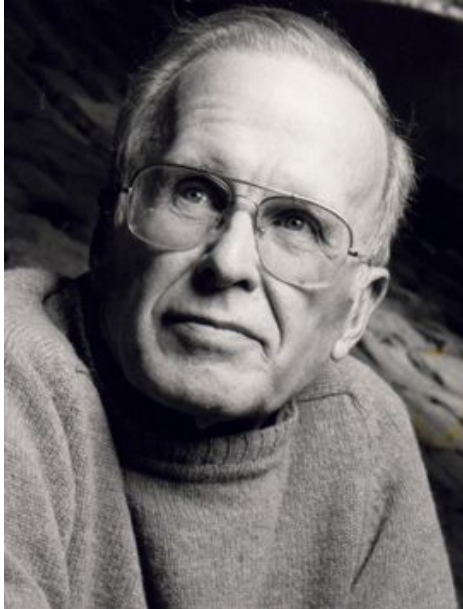
He received the 1977 Turing Award "*for profound, influential, and lasting contributions to the design of practical high-level programming systems, notably through his work on FORTRAN, and for publication of formal procedures for the specification of programming languages*".

[Wikipedia](#)

FORTRAN: Formula Translation

- Drafted in 1953 at IBM Research

- First compiler was completed in 1957

- Abstraction of a computer used by FORTRAN is based on the Turing Machine of 1936

- Successors of FORTRAN: BASIC, C, C++, Java, Python, ...

- Latest stable FORTRAN release is: Fortran 2018

1958: John McCarthy - father of A.I. and functional programming
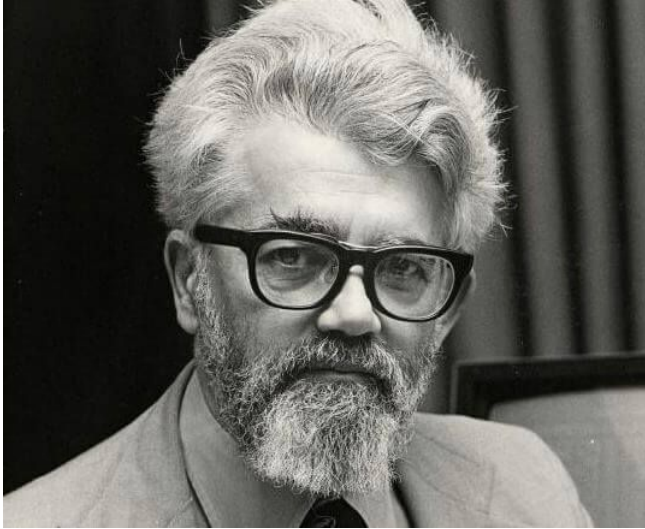
McCarthy was one of the founders of the discipline of artificial intelligence. He co-authored the document that coined the term "artificial intelligence" (AI), developed the Lisp programming language family, significantly influenced the design of the ALGOL programming language, popularized time-sharing, and invented garbage collection. Wikipedia

Lisp: List Processing

- Released in 1958
- Only FORTRAN is older than Lisp (by 1 year).
- Successors of Lisp
  - Racket (latest stable version: May 1, 2022)
  - Common Lisp (latest stable version: October, 2014)
  - Clojure (latest stable version: April 5, 2022)
- Lisp gave the world concepts including:
  - Dynamic memory allocation
  - Dynamic typing
  - Garbage collection
  - Concurrency
  - Macros

3. Programming Languages That Built the Digital Frontier

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1972: Brian Kernighan - The Man From Toronto
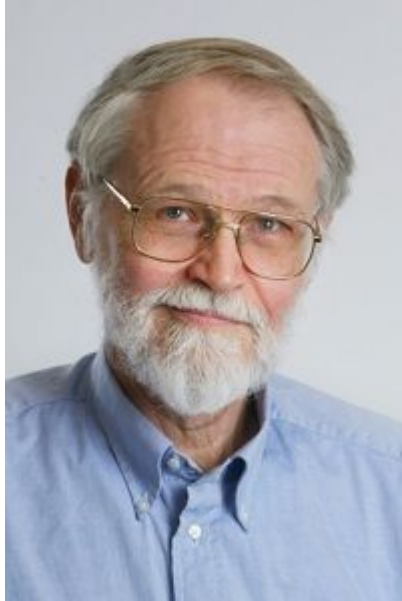
- Born in Toronto, Ontario, Canada

- B.Sc. in Engineering Physics at University of Toronto

- PhD in Electrical Engineering at Princeton University

- In 1972, invention of the C programming language

- In 2015, authored the Go programming language book

1972: Alan Kay gave the world Object Oriented Programming

- B.Sc. in molecular biology from University of Colorado Boulder, Colorado

- PhD in Computer Science in 1969, University of Utah

- Invented Object-oriented Programming and the Smalltalk programming language at Xerox Parc, Palo Alto, California

1979: Bjarne Stroustrup

- Masters in Mathematics in Aarhus University, Denmark in 1975

- PhD in Computer Science from University of Cambridge, 1979

- Invented the C++ programming language in 1979

1975: Gerald Sussman

- PhD from MIT in 1973

- Professor at MIT, in A.I.

- Invented Scheme, the first industrial scale Lisp implementation

1995: Guy Steele

- PhD in Computer Science at MIT, 1980
- Co-invented Scheme with his advisor Gerald Sussman
- Invented the Java programming language in 1995

1990: Simon Peyton Jones

- Diploma in Computer Science from University of Cambridge

- In 1990, co-invented Haskell, a pure functional programming language with a static type system

- Lead developer of the Glasgow Haskell Compiler (GHC) project

- Since 2021, he is an engineering fellow at Epic Games

4. The Industrial Era

1991: Guido van Rossum - Inventor of Python

- Masters in Mathematics and Computer Science, University of Amsterdam, 1982

- Invented Python, the programming language

- Helped to build a global scale community of Python developers

- Made Python the #1 language in data science and machine learning in 2000's

1995: Brendan Eich - Javascript

- B.Sc. in Mathematics and Computer Science from Santa Clara University

- Masters from University of Illinois

- Worked at Netscape in 1995:
  - *Put Scheme in the browser.*
  - LiveScript in September 1995
  - Renamed to Javascript for marketing reasons

- Co Founded Mozilla in 1998

1995: Yukihiro Matsumoto - Inventor of Ruby
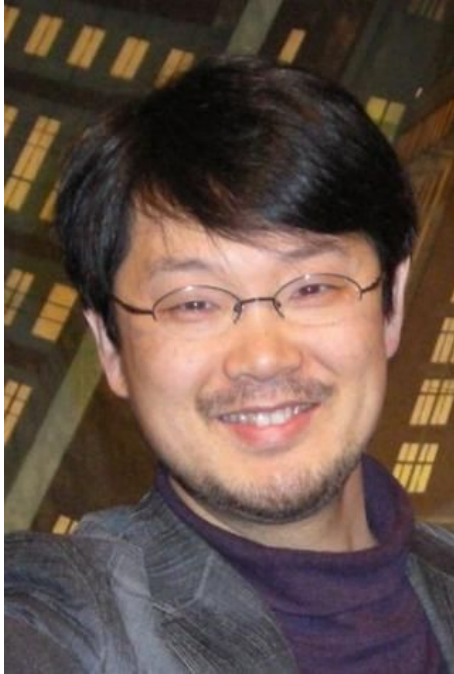
- Information Science degree from University of Tsukuba

- Invented Ruby in December 1995

1995: Rasmus Lerdorf - inventor of Php

- BA.Sc from System Design at University of Waterloo, 1983

- Released Php in 1995
  - Personal home page
  - First web-centric programming language

1974-2016: Donald Chamberlin - Co Inventor of SQL

- B.Sc. in Engineering from Harvey Mudd College

- MSc and PhD from Stanford University

- Worked at IBM Research

- Designed the first successful domain specific language (DSL)
    - Structured Query Language (SQL)
    - Relational database engines

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