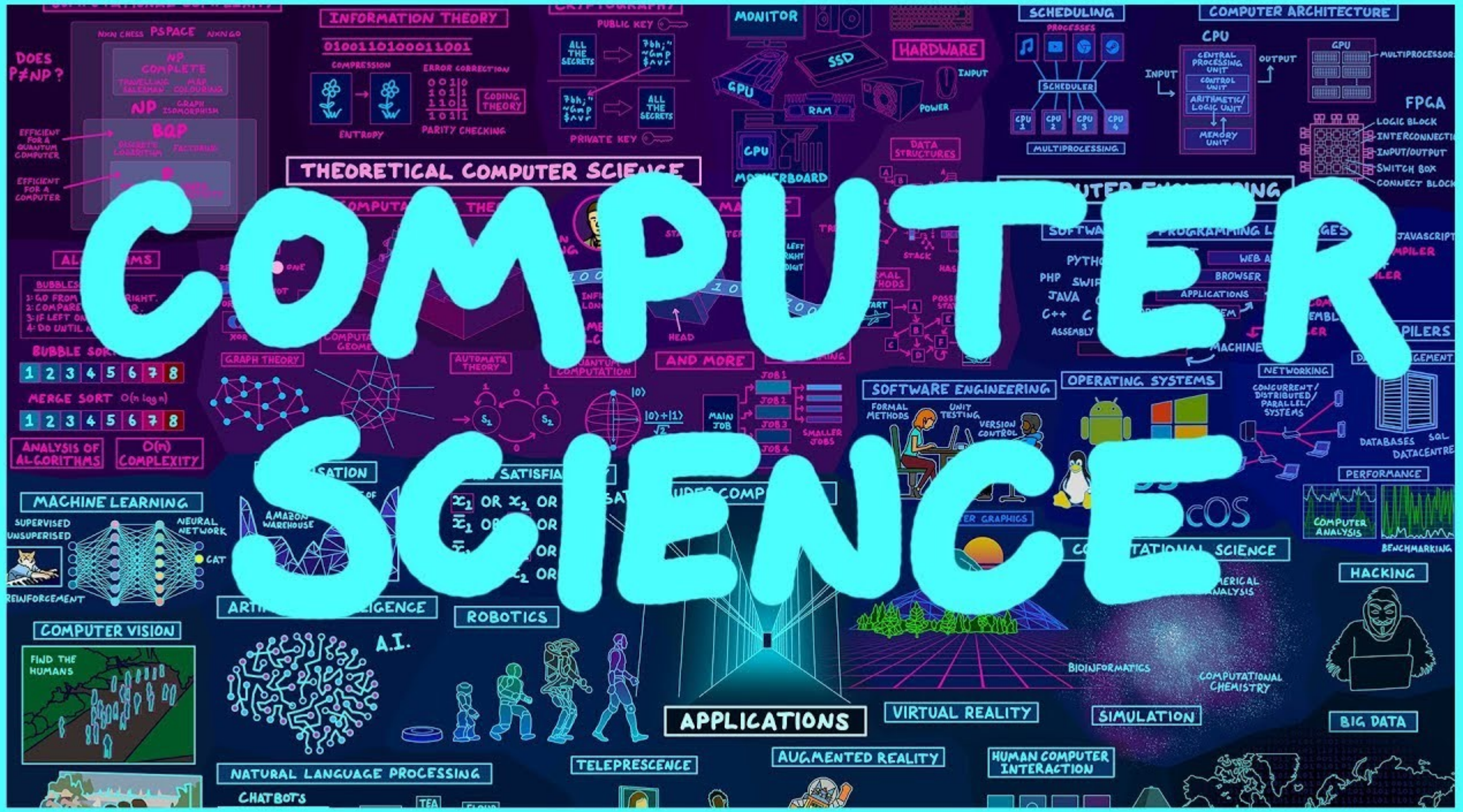

COMPUTER SCIENCE
THEORETICAL COMPUTER SCIENCE
INFORMATION THEORY
COMPUTER ARCHITECTURE
SCHEDULING
HARDWARE
DATA STRUCTURES
ALGORITHMS
BUBBLE SORT
MERGE SORT
ANALYSIS OF ALGORITHMS
O(n) COMPLEXITY
GRAPH THEORY
AUTOMATA THEORY
AND MORE
SOFTWARE ENGINEERING
OPERATING SYSTEMS
NETWORKING
MACHINE LEARNING
COMPUTER VISION
ROBOTICS
A.I.
APPLICATIONS
VIRTUAL REALITY
AUGMENTED REALITY
TELEPRESCENCE
NATURAL LANGUAGE PROCESSING
HUMAN COMPUTER INTERACTION
SIMULATION
BIOINFORMATICS
COMPUTATIONAL CHEMISTRY
HACKING
BIG DATA
PERFORMANCE
BENCHMARKING
DATABASES
SQL
DATACENTRE
FPGA
MULTIPROCESSOR
DOES P≠NP?
PSPACE
NP COMPLETE
NP
BQP
PUBLIC KEY
PRIVATE KEY
ENTROPY
PARITY CHECKING
CODING THEORY
MONITOR
SSD
GPU
RAM
CPU
MOTHERBOARD
POWER
INPUT
SCHEDULER
MULTIPROCESSING
CENTRAL PROCESSING UNIT
CONTROL UNIT
ARITHMETIC/LOGIC UNIT
MEMORY UNIT
LOGIC BLOCK
INPUT/OUTPUT
SWITCH BOX
CONNECT BLOCK
PYTHON
PHP
JAVA
C++
ASSEMBLY
WEB APPLICATIONS
BROWSER
FORMAL METHODS
UNIT TESTING
VERSION CONTROL
CONCURRENT/DISTRIBUTED/PARALLEL SYSTEMS
COMPUTER ANALYSIS
SUPERVISED
UNSUPERISED
NEURAL NETWORK
REINFORCEMENT
FIND THE HUMANS
CHATBOTS
JOB 1
JOB 2
JOB 3
JOB 4
MAIN JOB
SMALLER JOBS

WHAT ARE COMPUTERS?

Until the 1940s the word “computer” was a job title

- computers were people trained to carry out mathematical operations
- they followed a set of precise instructions required to create mathematical tables used for navigation, astronomy, business



WHAT IS COMPUTER SCIENCE?

“Computer Science is no more about computers than astronomy is about telescopes”

Edsger Dijkstra (1930 - 2002)



WHAT IS COMPUTER SCIENCE?

Computer Science is the study of computers

(??)

- This leaves aside the theoretical work in CS, which does not make use of real computers, but of formal models of computers
- Actually, the early work in CS took place before the development of the first computer

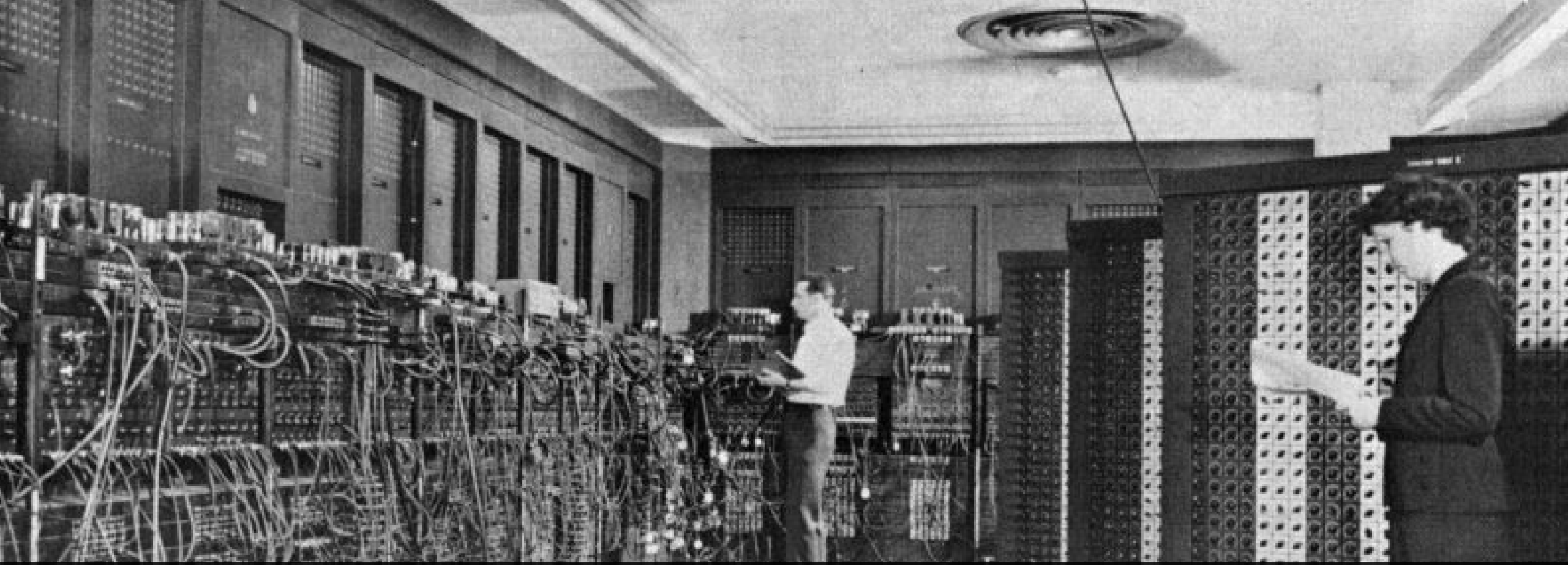


WHAT IS COMPUTER SCIENCE?

Computer Science is the study of how to write computer programs (programming) (??)

- Programming is a big part of CS.. ..but it is not the most important part.





First computer: 1940s



First computer: 1940s

First computer program: 1843

COMPUTATION



COMPUTATION

Computation is a sequence of well-defined operations that lead from an initial starting point to desired final outcome



CS

- Computer science is the ***study of computation***
  - investigating problems that can be solved computationally
  - Using programming languages to describe computations



CONT …

- machines that carry out computations
- theoretical limits of computation (what is or is not computable)
- computational solutions to problems in math, science, medicine, business,



HISTORY

COMPUTING MACHINES

- Fixed-program computers
- Stored-program computers



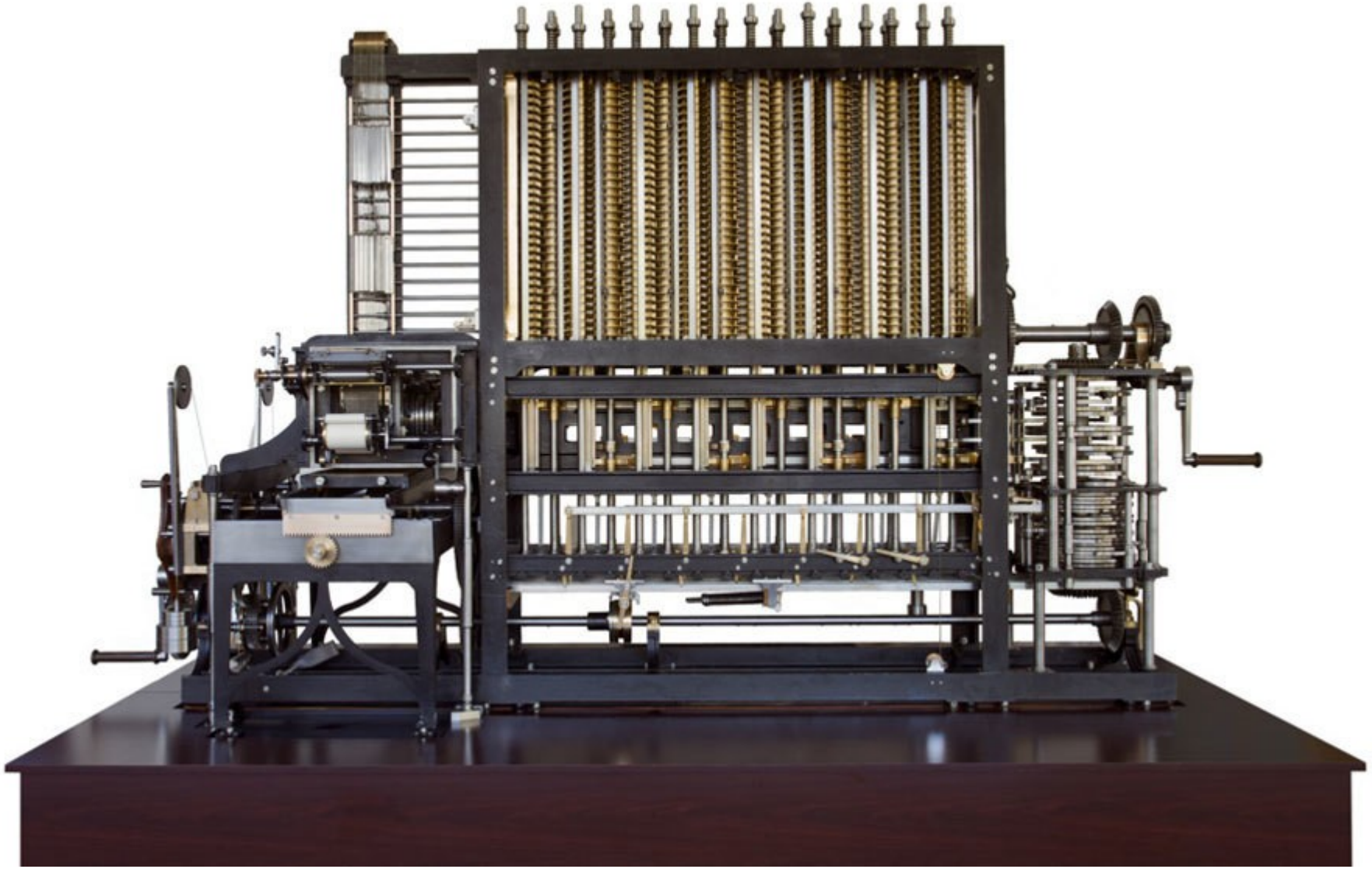
BABBAGE’S MACHINES

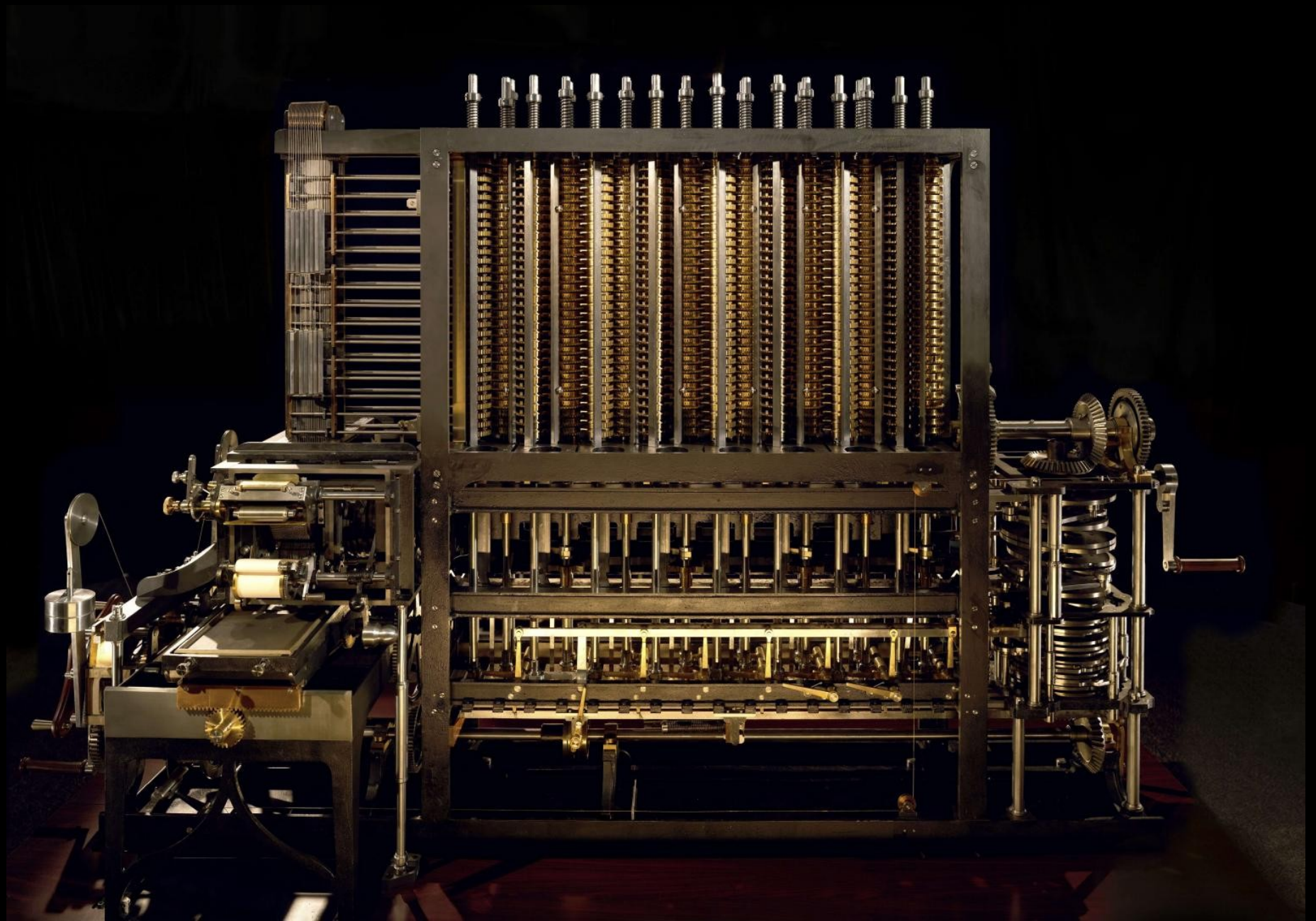
Difference Engine

Analytical Engine



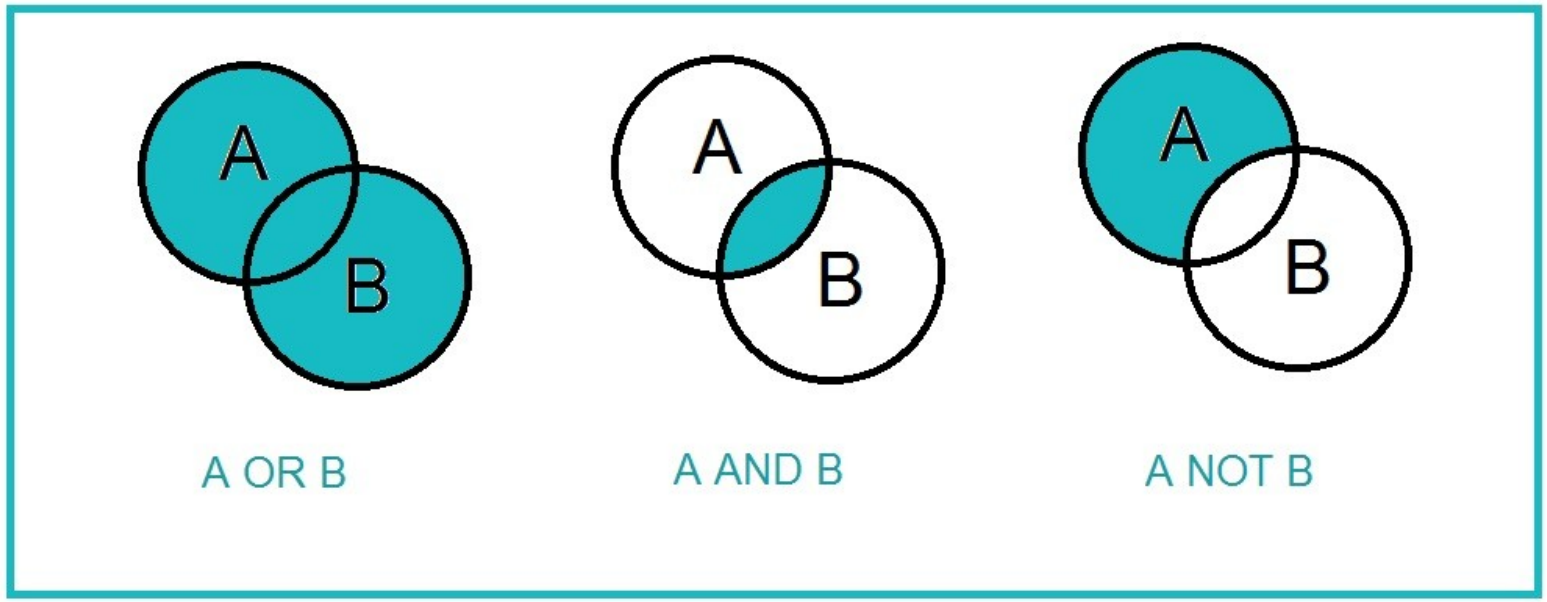
Charles Babbage (1791-1871)

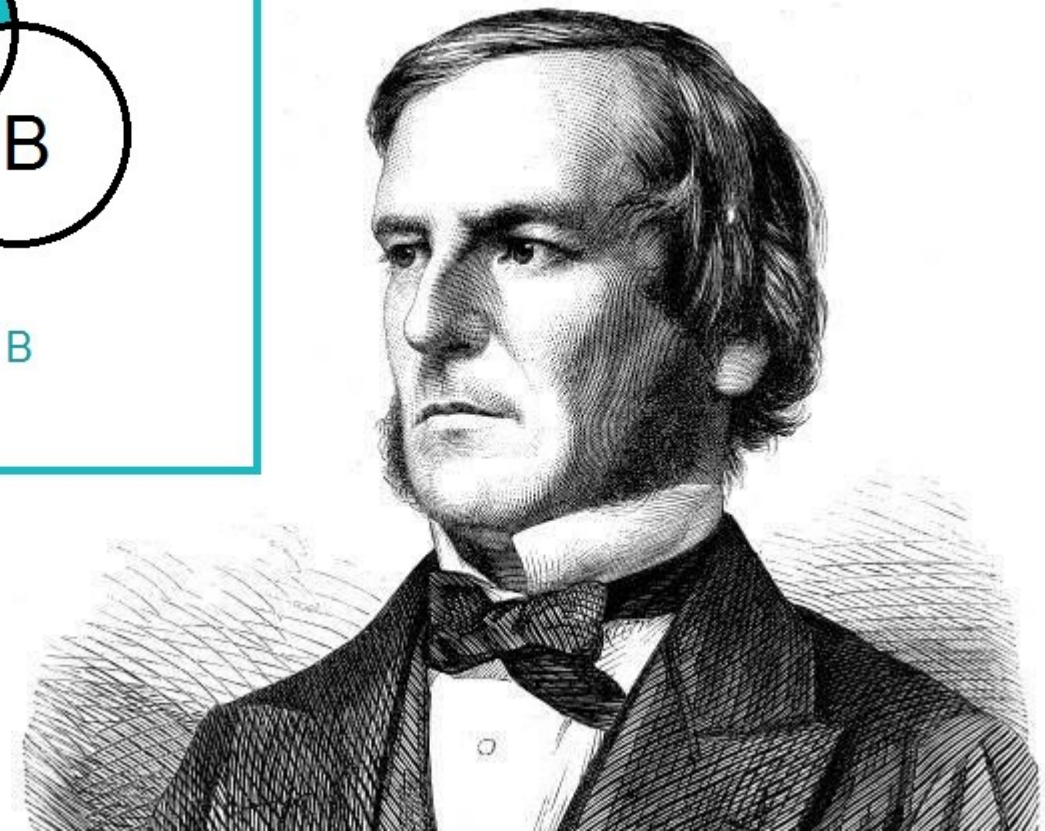


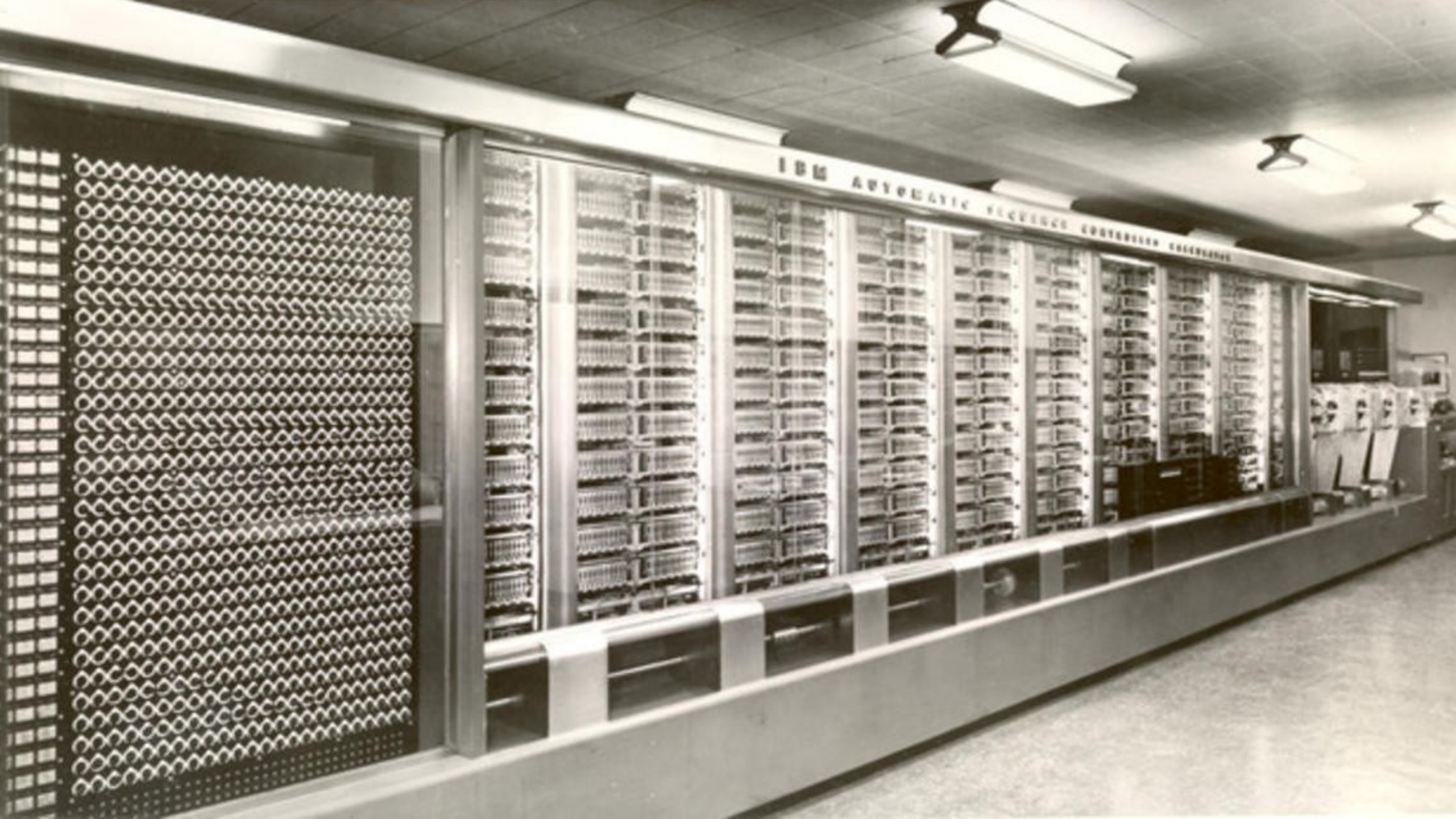


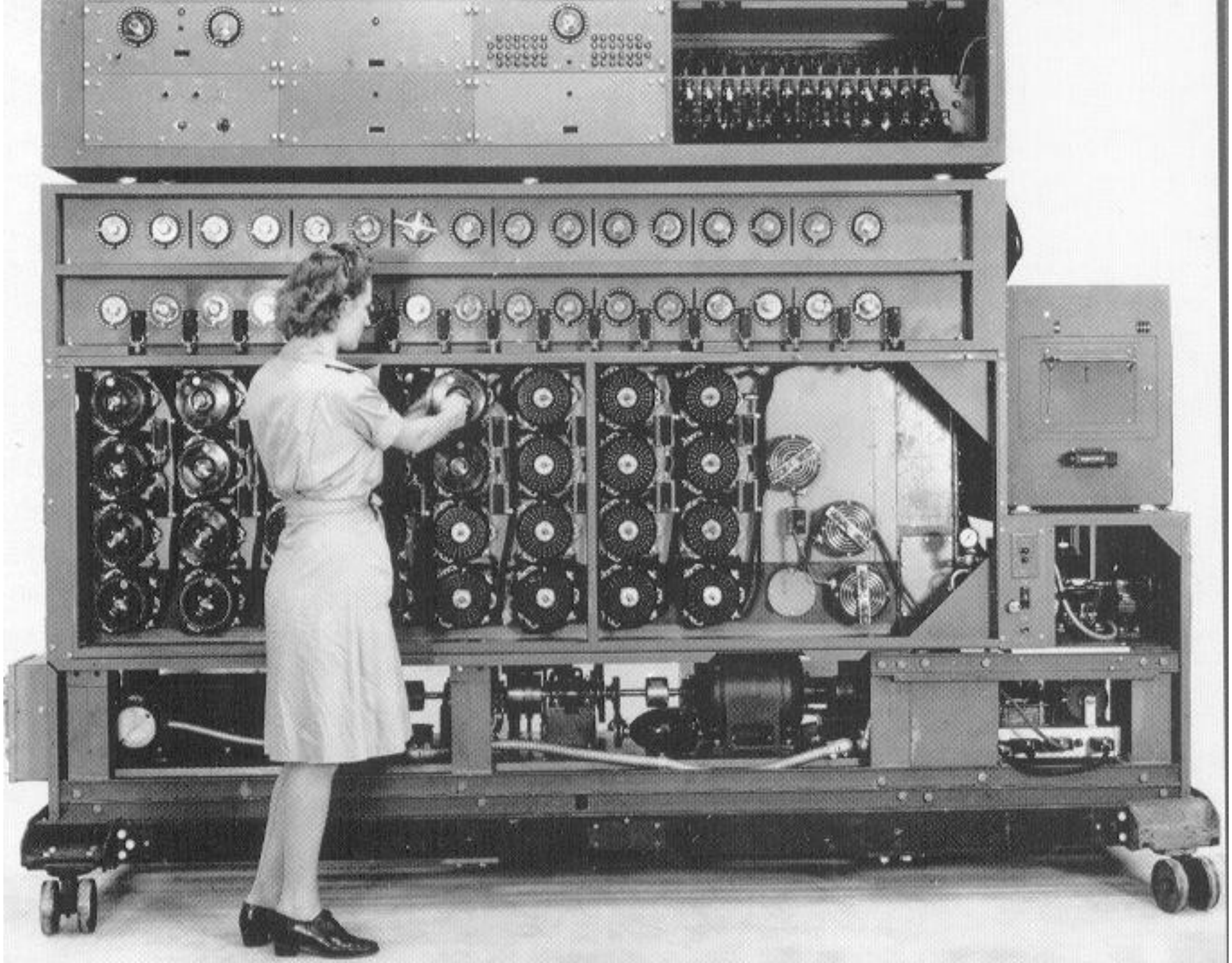


BOOLEAN

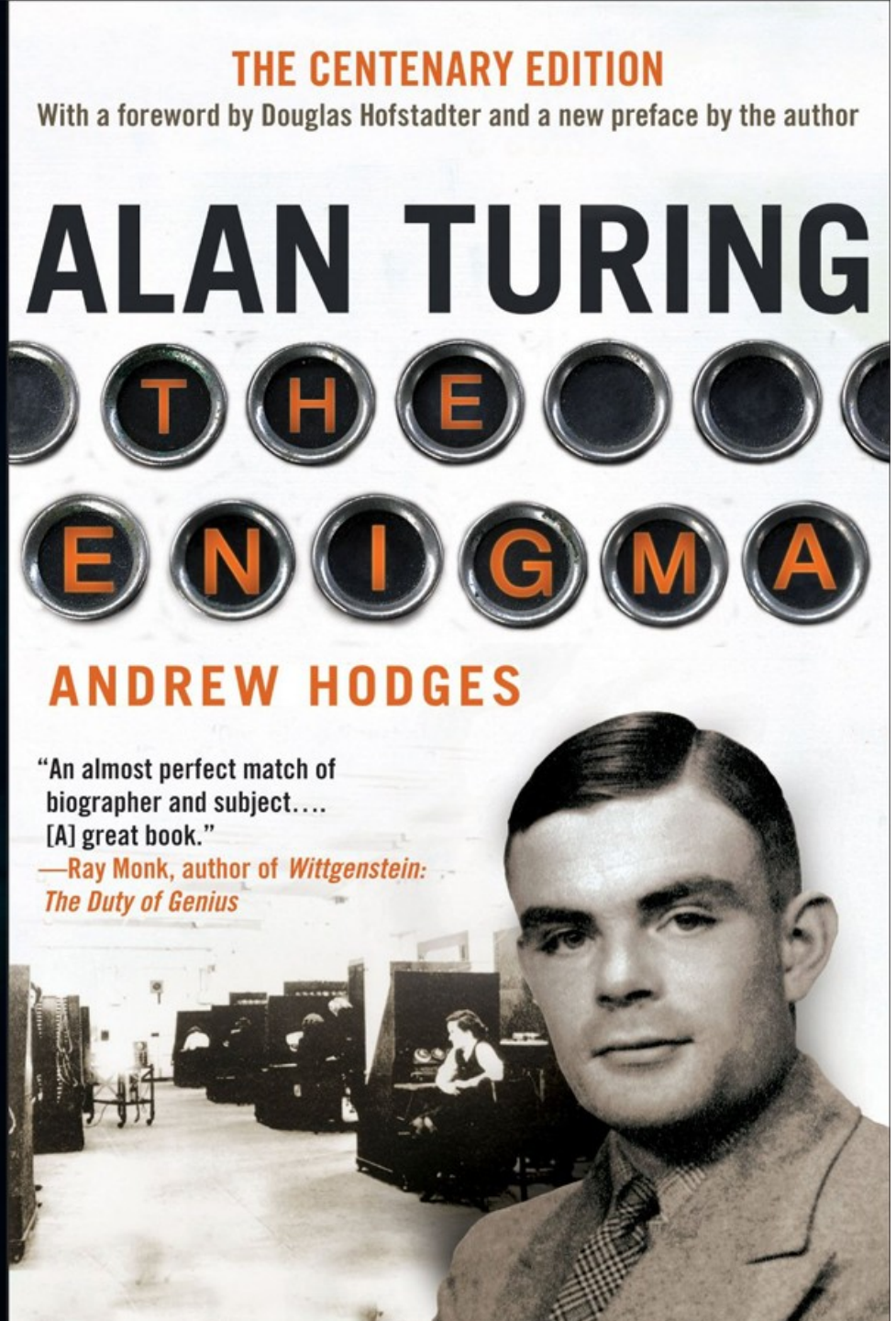




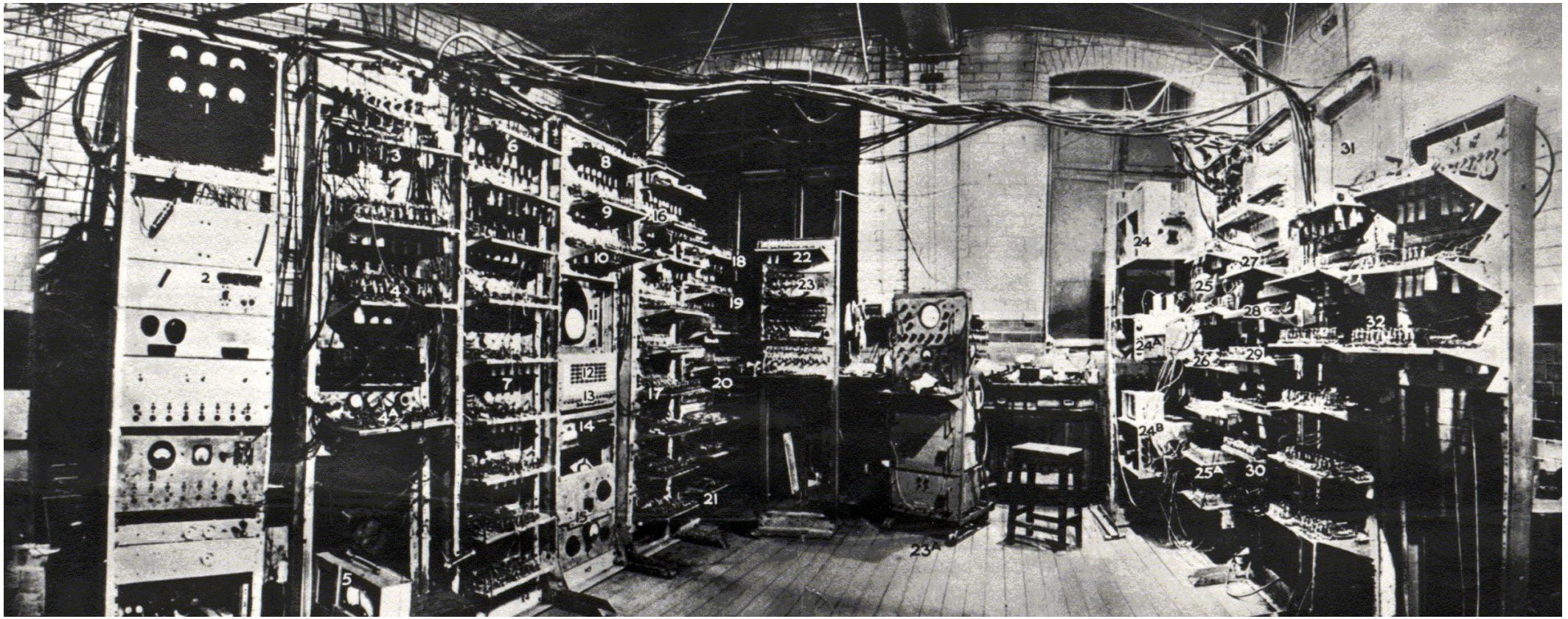

IBM




THE TRUE ENIGMA
WAS THE MAN WHO CRACKED
THE CODE
BENEDICT CUMBERBATCH
KEIRA KNIGHTLEY
THE IMITATION GAME
COMING SOON


THE CENTENARY EDITION
With a foreword by Douglas Hofstadter and a new preface by the author
ALAN TURING
THE ENIGMA
ANDREW HODGES
"An almost perfect match of biographer and subject.... [A] great book."
—Ray Monk, author of Wittgenstein: The Duty of Genius

BIRTH OF MODERN COMPUTING



COMPUTATIONAL THINKING



WHAT CAN A COMPUTER DO?

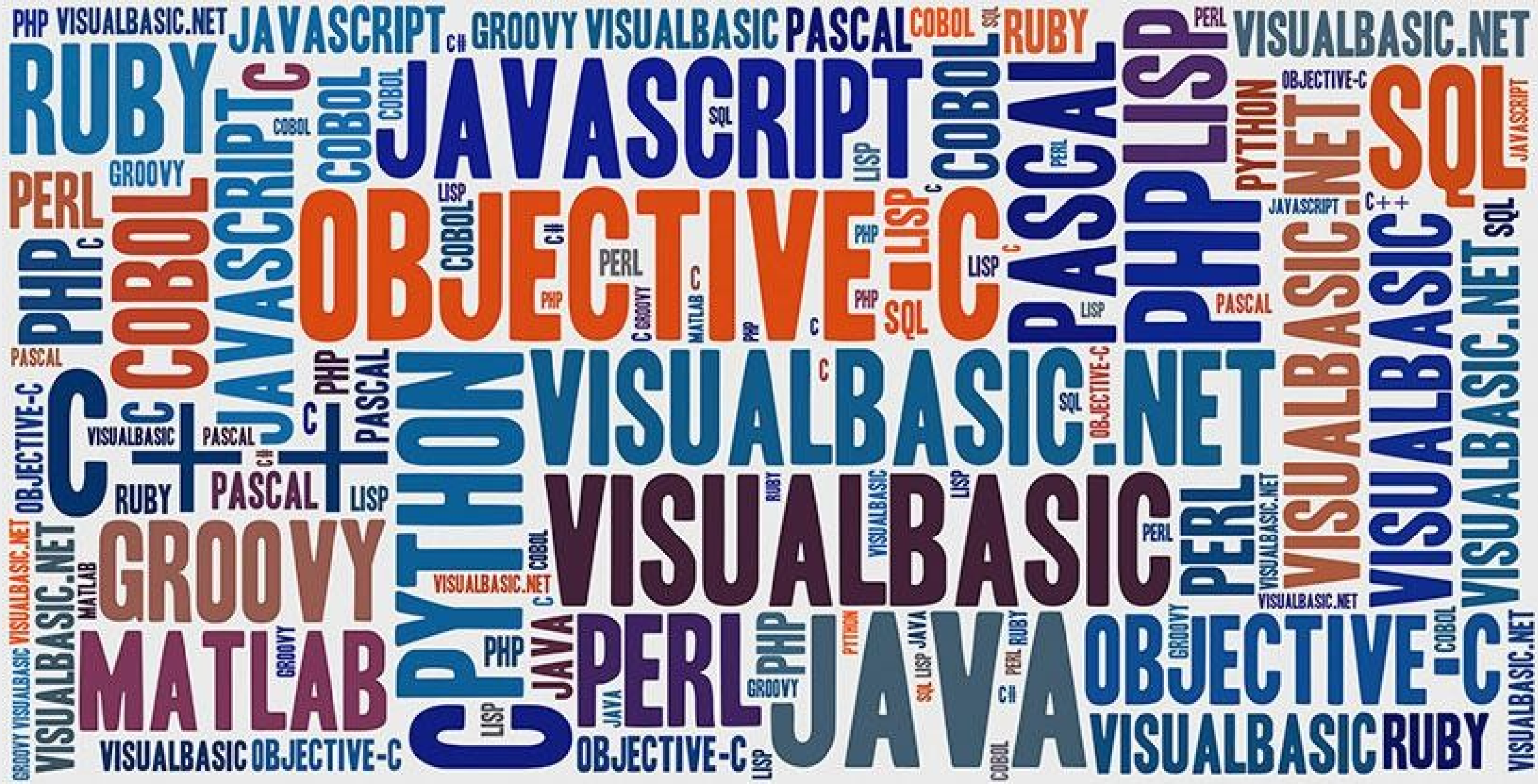




PROGRAMS

A program is a sequence of instructions that specifies how to perform a computation.




PHP VISUALBASIC.NET JAVASCRIPT C# GROOVY VISUALBASIC PASCAL COBOL SQL RUBY PERL VISUALBASIC.NET
RUBY JAVASCRIPT C COBOL JAVASCRIPT SQL COBOL PASCAL PHP LISP PYTHON SQL
PERL GROOVY PHP C COBOL OBJECTIVE-C LISP C PASCAL VISUALBASIC.NET C++
C COBOL JAVASCRIPT PHP PASCAL PYTHON VISUALBASIC.NET VISUALBASIC .NET
C++ C# PASCAL RUBY PASCAL LISP VISUALBASIC VISUALBASIC.NET
GROOVY VISUALBASIC.NET PERL VISUALBASIC.NET
MATLAB PYTHON PERL JAVA OBJECTIVE-C
VISUALBASIC OBJECTIVE-C VISUALBASIC RUBY

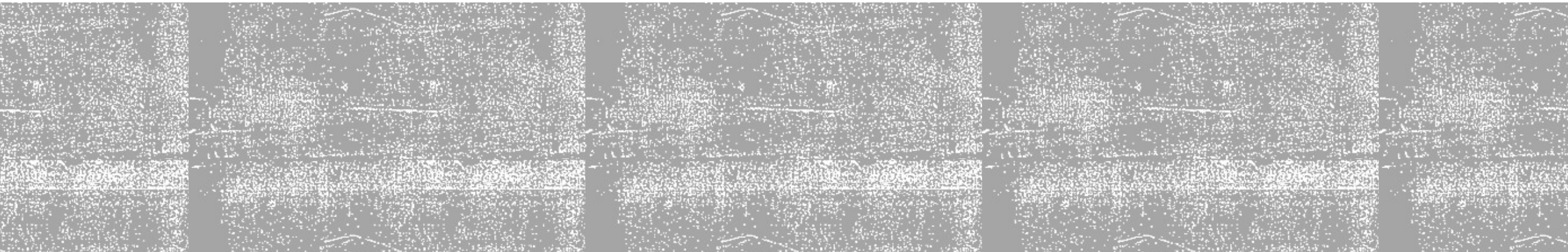
C



hello, world

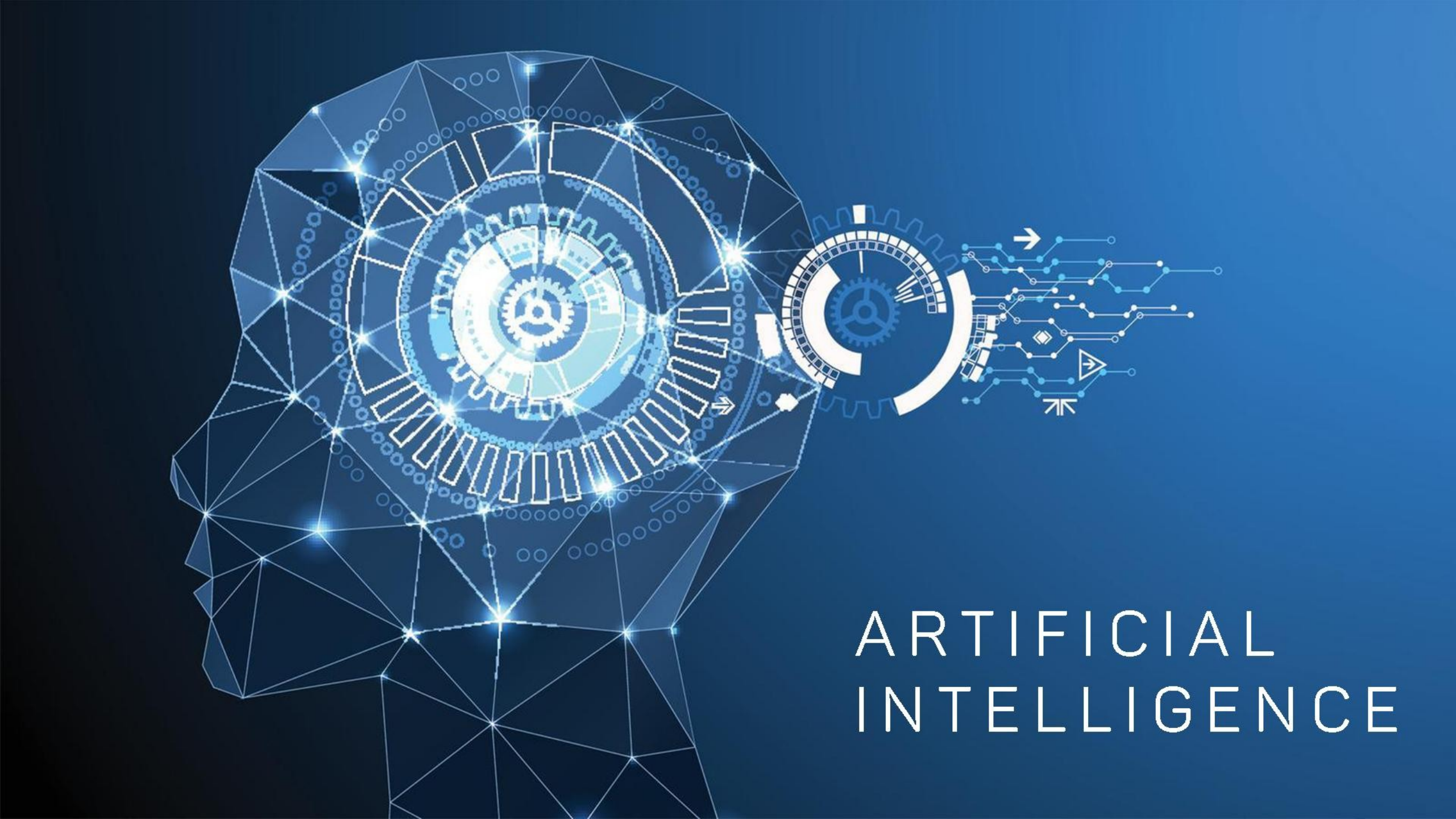


WHERE IS COMPUTING BEING USED?








ARTIFICIAL
INTELLIGENCE