History of Computing

CS 146
Intro to Web Programming and Project Development

Objectives

Students will:

- Discover various computers that were developed over the years

- Learn the reasons behind each invention

- Research people or creations that revolutionized the computing world

But do we have to?

- The Internet was not always around!
- Knowing its history will let you understand design choices made.
- All came from natural thought process.
- Knowing history is good for your brain!
- You'll learn about all the layers of technology that allow you to check your status updates in social media applications.
- Stop complaining, this can be fun!
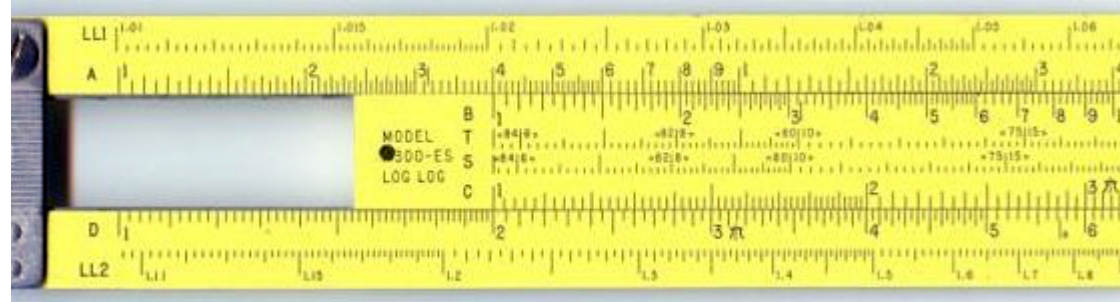- …Seriously

Primitive Computation - Abacus

- The abacus (plural abaci or abacuses), also called a counting frame.
  - Calculating tool that was in use centuries before the adoption of the written modern numeral system.
  - The period 2700–2300 BC saw the first appearance of the Sumerian abacus.

# How does it work?

- Let's see…

Slide Rule

- Sometimes called slipstick in the US.
- The slide rule is used primarily for multiplication and division.
- Also good for functions such as roots, logarithms and trigonometry.
- Not normally used for addition or subtraction.
- Reverend William Oughtred and others developed the slide rule in the 17th century based on the emerging work on logarithms by John Napier.
- Used up until creation of digital calculator in 1974.

Pascal's Calculator

- Blaise Pascal along with Wilhelm Schickard was one of two inventors of the mechanical calculator in the early 17th century. Pascal made his invention in 1642.

- First called the Arithmetic Machine, Pascal's Calculator, and later Pascaline, his invention was primarily intended as an adding machine which could add and subtract two numbers directly.

- Pascal went through 50 prototypes before presenting his first machine to the public in 1645.

Pascal's Calculator
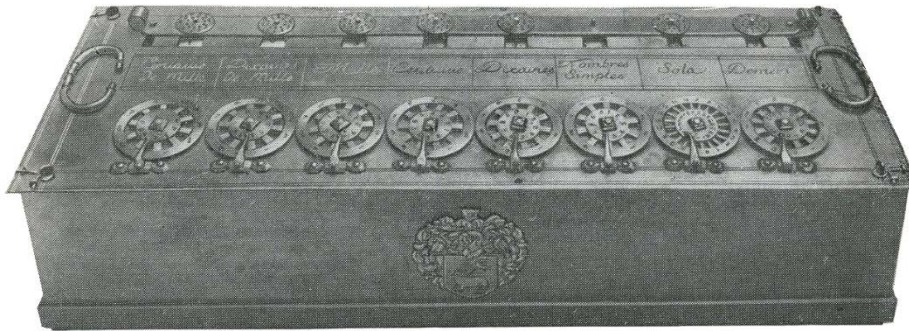
Joseph Marie Jacquard

- French weaver and merchant
- The punch card would make its name in 1801 with the Jacquard loom.
- The punch cards in the loom was used to manipulate and control the series of operations that the loom was suppose to carry out.
- Similar to a on/off theory where if there was a hole punched at a certain spot, the needle would be able to pass through the hole and that would be a "on" signal and vice versa for the "off" signal.

Jacquard was not first!

- 1725 - Basile Bouchon (cloth)
- 1728 - One of Bouchon's assistants, Jean-Baptiste Falcon (chain of punched cards)
- 1741 - Inventor Jacques de Vaucanson (punched paper strip)
- 1801 - Jacquard machine that was credited to the birth of it and the one which led to impact the development of the early computing systems.

Charles Babbage

- Designed Difference Engine 1, Analytical Engine, and Difference Engine 2

- Babbage never built any of his ideas

- The analytical engine would have been able to perform general-purpose computing
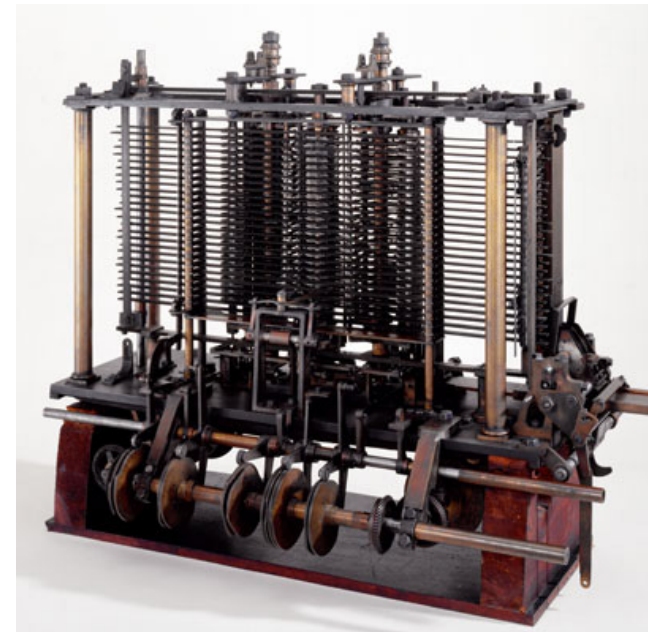
George Boole

- George Boole (November 2, 1815 – December 8, 1864) was an English mathematician, philosopher and logician.
- Worked in the fields of differential equations and algebraic logic.
- Best known as the author of *The Laws of Thought*.
- As the inventor of the prototype of what is now called Boolean logic, which became the basis of the modern digital computer.
- … "no general method for the solution of questions in the theory of probabilities can be established which does not explicitly recognise … those universal laws of thought which are the basis of all reasoning" …
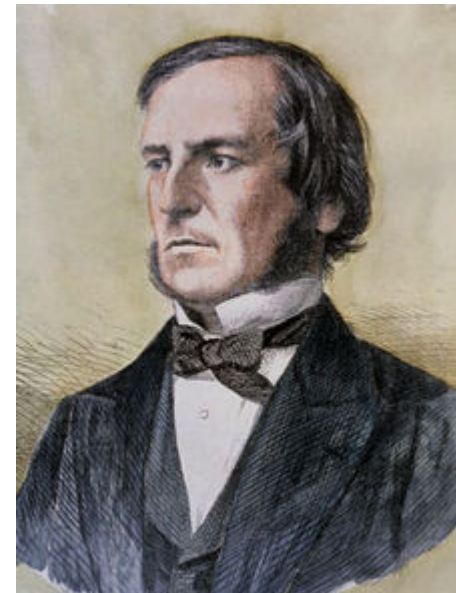
Howard Aiken

- Presented Mark 1 to IBM in Nov. 1937.
- Mark I was a general purpose electro-mechanical computer that was used in the war effort during the last part of World War II.
- The Mark I had 60 sets of 24 switches for manual data entry and could store 72 numbers, each 23 decimal digits long.
- It could do three additions or subtractions in a second. A multiplication took six seconds, a division took 15.3 seconds, and a logarithm or a trigonometric function took over one minute.
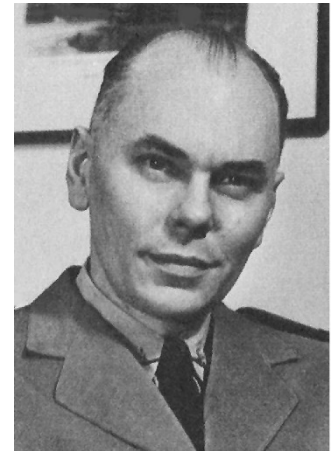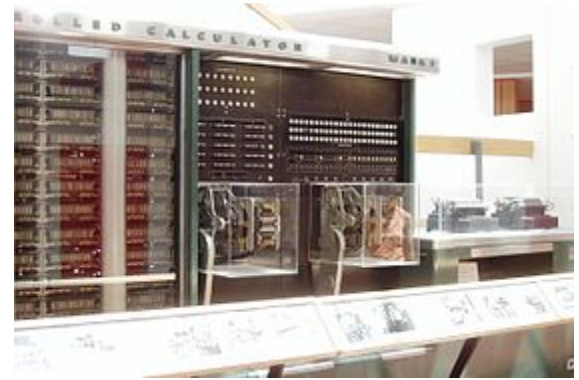
Conrad Zuse

- In 1937, Zuse submitted two patents that anticipated a von Neumann architecture.

- He finished the Z1 in 1938.

- The Z1 contained some 30,000 metal parts and never worked well due to insufficient mechanical precision.

- On 30 January 1944, the Z1 and its original blueprints were destroyed with his parents' flat and many neighboring buildings by a British air raid in World War II.

Moving Onward…

- 1937 – First fully electronic digital computer designed by John Atanasoff (Iowa State College), built in 1939 with Clifford Berry. Known as ABC.

- 1943-46 – John W. Mauchly and J. Presper Eckert build the ENIAC (Electronic Numerical Integrator and Computer)

- 1945 – John von Neumann comes up with the stored-program concept (the von Neumann architecture)

- 1947 – Creation of transistor

- 1951-52 First 2 von Neumann machines EDVAC and IAS

- 1955 ENIAC is dismantled

- Architecture remains globally the same
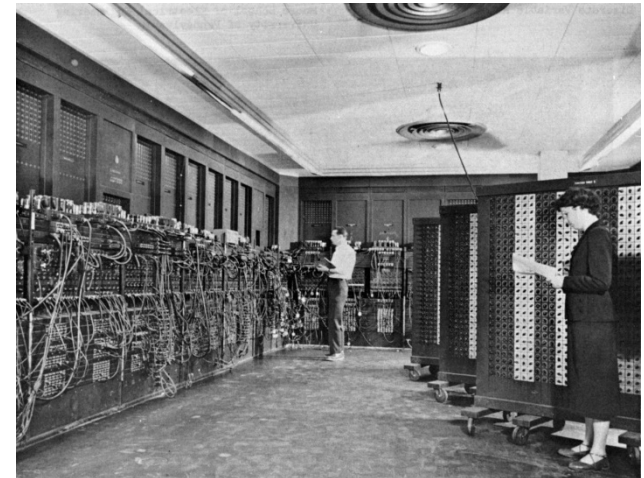
IBM PC

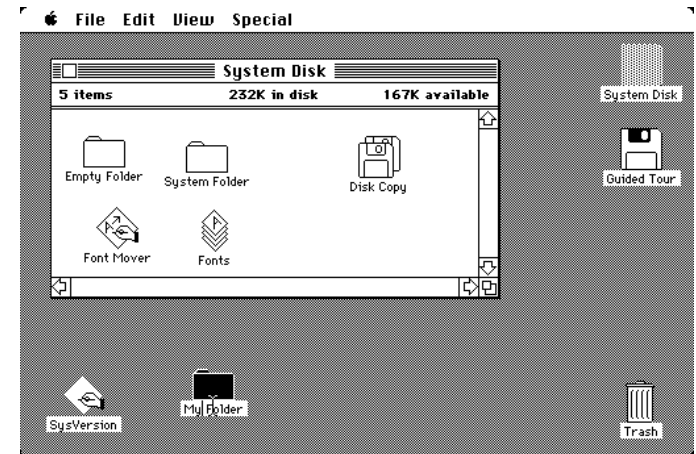| IBM PC (model 5150)	
IBM Personal Computer model 5150 with IBM CGA monitor (model number 5153), IBM PC keyboard, IBM 5152 printer and paper stand.	
Type	Personal computer
Release date	August 12, 1981
Discontinued	April 2, 1987
Operating system	IBM BASIC / PC DOS 1.0 CP/M-86 UCSD p-System
CPU	Intel 8088 @ 4.77 MHz
Memory	16 kB ~ 256 kB
Sound	1-channel PWM

Apple Lisa

Apple Lisa	
Apple Lisa, with an Apple ProFile external hard disk sitting atop it. Note the dual 5.25-inch "Twiggy" floppy drives.	
Type	Personal computer
Release date	January 19, 1983
Introductory price	US $9,995 (1983)
Discontinued	August 1986
Operating system	Lisa OS, Xenix
CPU	Motorola 68000 @ 5 MHz

Apple Macintosh

- Introduced by Steve Jobs on January 24, 1984

- First mass-market personal computer featuring an integral graphical user interface and mouse

- Had 128 kB of RAM (expandable to 512 kB by soldering directly onto the mainboard)

Microsoft DOS

Microsoft Windows

Name	Release Date	Version Number
Windows for Workgroups 3.11	November 1993	3.11
Windows NT 3.1	27 July 1993	NT 3.10
Windows 3.1	April 1992	3.10
Windows 3.0	22 May 1990	3.00
Windows 2.11	13 March 1989	2.11
Windows 2.10	27 May 1988	2.10
Windows 2.0	9 December 1987	2.0
Windows 1.04	April 1987	1.04
Windows 1.03	August 1986	1.03
Windows 1.01	20 November 1985	1.01