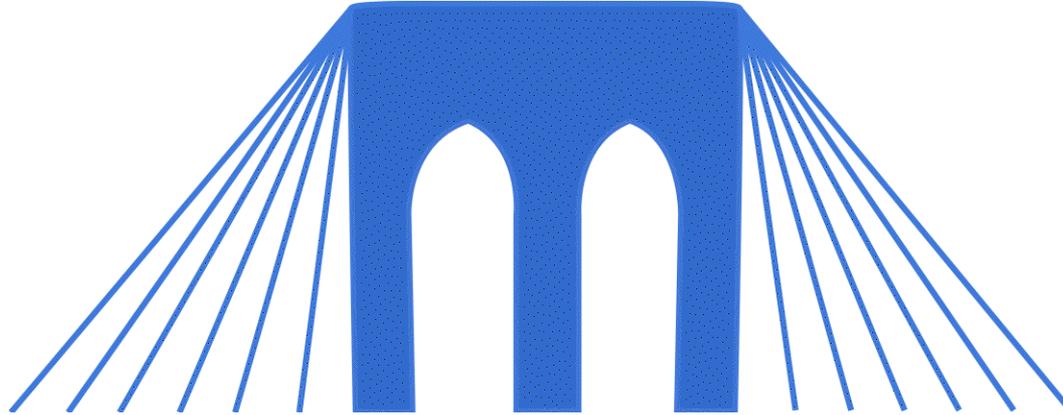# BRIDGES TO COMPUTING

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A (Very) Brief History of Computing

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BRIDGES TO COMPUTING

2011

Early History

- The 1200's - A Moslem cleric proposes a method for systematically approaching/solving problems using a series of written procedures.

  - Perhaps Arab mathematician and polymath, Al-Kindi (timeline is off) or one of his teachers.

- 1642 - Blaise Pascal, French mathematician, physicist, and theologian, invents the first commercial calculator, a hand powered adding machine (a fixed program computer).

"Since we cannot know all that there is to be known about anything, we ought to know a little about everything."

- Blaise Pascal

Blaise Pascal

Those glorious 1800's (Part I)

- 1801 - Frenchman, Joseph-Marie Jacquard builds a loom that weaves by reading punched holes stored on small sheets of hardwood.

- 1820 - Charles Babbage begins his lifelong quest for a stored program machine.

- 1842 - Ada Lovelace (using Babbages machine) mechanically translates a short written work. She is generally regarded as the first programmer.

"We may say most aptly, that the Analytical Engine weaves algebraical patterns just as the Jacquard-loom weaves flowers and leaves."

- Ada Lovelace

# Ada Lovelace

Those glorious 1800's (Part II)

- 1854 - George Boole creates (among other things) Boolean logic. He is recognized by many as the father of computer science.

- 1890 - US census is tabulated on punch cards similar to the ones used 90 years earlier to create weaves. System uses electric power (not mechanical). The Hollerith Tabulating Company is the forerunner of today's IBM.

- 1892 William Burroughs, introduces a commercially successful, electric printing calculator.

"No matter how correct a mathematical theorem may appear to be, one ought never to be satisfied that there is not something wrong about it, until it also gives the impression of being beautiful."

- George Boole
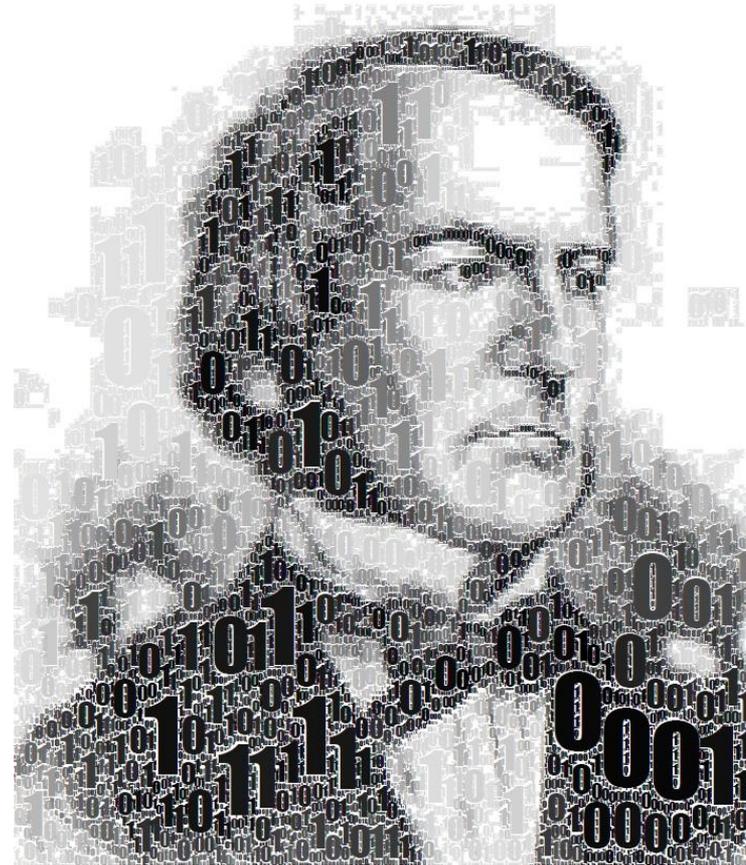
George Boole

WAR!!!!

- 1930's - The Enigma, a complex mechanical encoder is used by the Germans and they believe it to be unbreakable. To break the code, the British, led by Alan Turing, build the Colossus Mark I.

- Turing proposes a "Universal Machine" capable of "computing" any algorithm in 1937.

- 1940 George Steblitz transmit a problem for his Complex Number Calculator from New Hampshire to New York and receives the results. It is the first example of a network.

- 1943 Electronic Numerical Integrator And Computer (ENIAC) designed by John Mauchly, Presper Eckert of the Moore School, with help from John von Neumann and others.

- 1943 - Thomas Watson, chairman of IBM, 1943: "I think there is a world market for maybe five computers."

"We can only see a short distance ahead, but we can see plenty there that needs to be done."

- Alan Turing

Alan Turing

"Amazing Grace"

- 1944 - The Havard Mark I computes complex tables for the U.S. Navy. Liutenant, Grace Hopper programs the machine and coins the term debugging.

- 1945 - Scientists employed by Bell Labs complete work on the transistor; for which John Bardeen, Walter Brattain and William Shockley receive the Nobel Prize in Physics in 1956.

- 1952 - Grace Hopper proposes "reusable software": code segments that could be extracted and assembled according to instructions in a "higher level language." The concept of compiling is born. Hopper would revise this concept over the next twenty years and her ideas would become an integral part of all modern computers.

"A ship in port is safe, but that is not what ships are for. Sail out to sea and do new things."

- Grace Hopper

Rear Admiral Grace Hopper (and the destroyer USS Hopper)

Goodbye Vacuum Tubes

- 1958 - Seymour Cray heads the development team of CDC1604 the first transistor powered computer.

- 1964 - IBM introduces the System/360 a business oriented machine. Dartmouth College introduces TSS(Time Share System) a networking system. Within a year MIT uses the first minicomputer (DEC's PDP-8) to manage telephone lines

- 1969 - Bell Labs develops UNIX (Kernighan, Thompson, Ritchie) and the C language. Alan Keys, who will later become a designer for Apple, proposes the "personal computer." Intel is formed. The movie "Colossus: The Forbidden Project" has a supercomputer as the villain.

- 1971 - Texas Instruments introduces the first "pocket calculator." It weighs 2.5 pounds.

Dr. Forbin: I think your mother was right. I think Frankenstein ought to be required-reading for all scientists.

Colossus: So that you will learn by experience that I do not tolerate interference, I will now detonate the nuclear warheads.
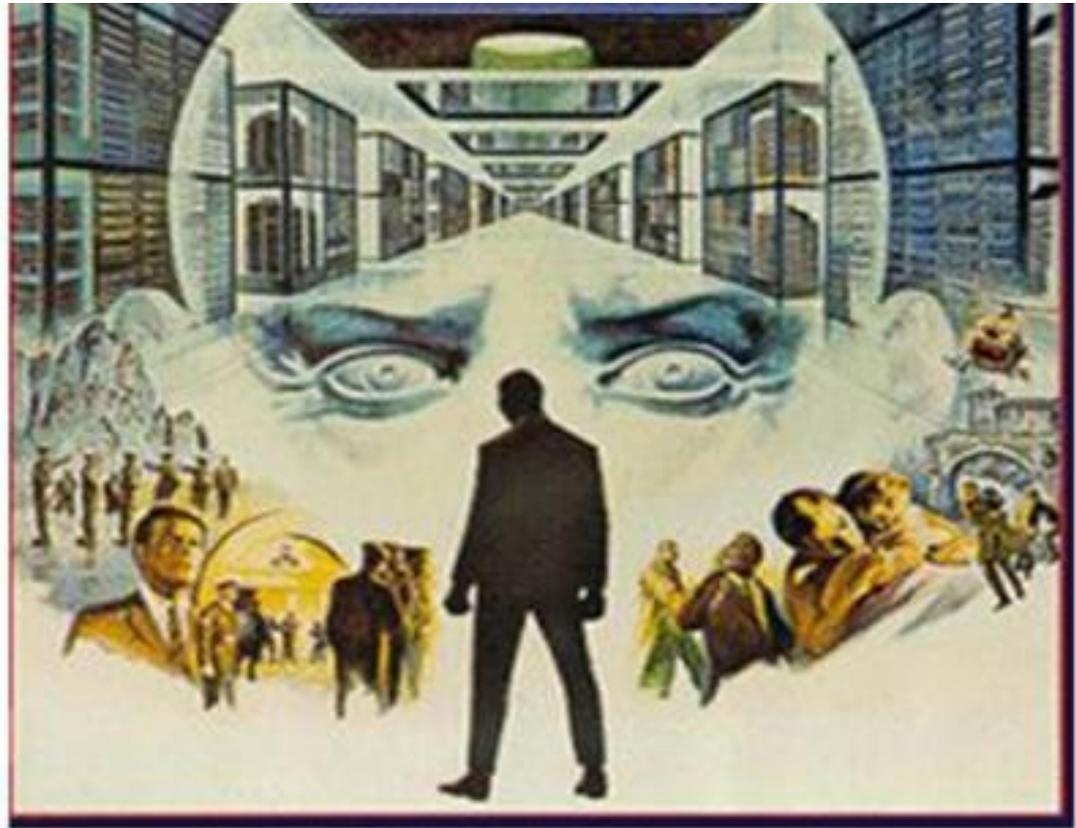
THIS IS THE DAWNING OF THE AGE OF

Colossus (1969)

Computers in the Home.

- 1975 - The first personal computer is marketed in kit form. The Altair features 256 bytes of memory. Bill Gates, with others, writes a BASIC compiler for the machine.

- 1976 - Apple begins to market PC's, also in kit form. It includes a monitor and keyboard.

- 1977 – Department stores begin to sell PC's.

- 1981 - IBM introduces it's PC in 1981 (it's actually IBM's second attempt, but the first failed miserably).

- 1982 Time selects the computer as its Man of the Year.

Yes... It's made out of wood.

The Apple 1

IBM PC

- The IBM Personal Computer, model number 5150, was introduced on August 12, 1981.

- Built from "off the shelf" components it's "open architecture" meant other manufacturers could produce compatible components and software without purchasing licenses.

- IBM PC architecture becomes a defacto standard.

- Mark Dean who was instrumental in the invention of the IBM-PC still holds three of IBM's original nine PC patents.

Mark Dean

"A lot of kids growing up today aren't told that you **can** be whatever you want to be. There may be obstacles, but there are no limits."

– Mark Dean

The IBM PC

This is one of the 1st IBM PC's. You almost certainly own one of it's great great great great great great great great great great great grand descendants.

Today

- Almost all computers in use today are more or less like the IBM PC in terms of motherboard architecture and system layout.

- Windows and Intel have also had the same effect of forcing (or allowing) their design systems to dominate the entire PC market.

- New trends (portable device, tablets, wearable computers) may also become norms.

What's next? Who knows?

- Who will be the next great computer science hero?
- What will be the next great invention?
- Think of all the amazing computer breakthroughs that have happened in the last year:
  - ○
  - ○
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It's amazing how much science fiction, has eventually, become science fact.

Cylons

The End