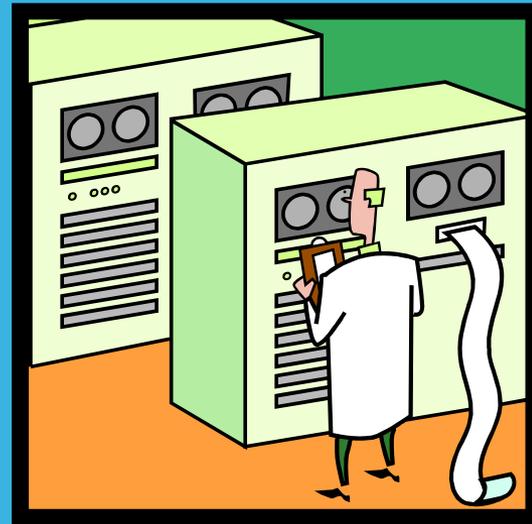
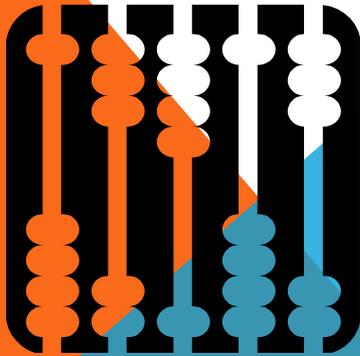




CSCA0102 IT AND BUSINESS APPLICATIONS

LESSON 3

A HISTORY OF THE COMPUTER



FIVE ERAS IN COMPUTER DEVELOPMENT

Pre-History

Electronics

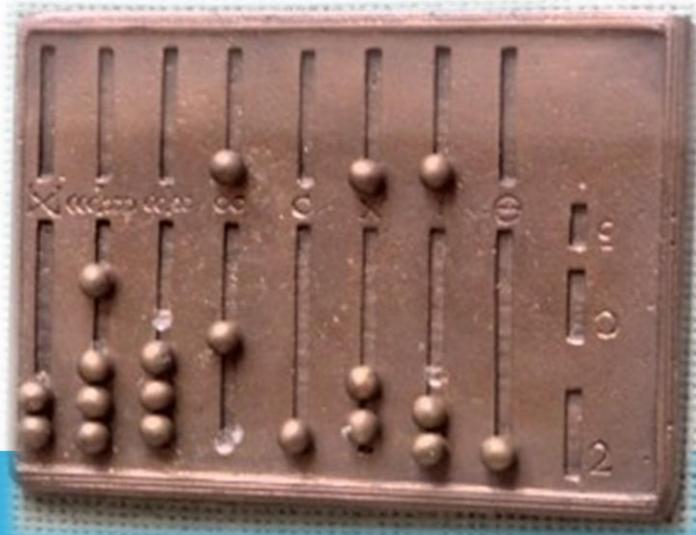
Mini

Micro

Network

PRE-HISTORY ERA

The abacus is believed to have been invented in 4th century B.C.



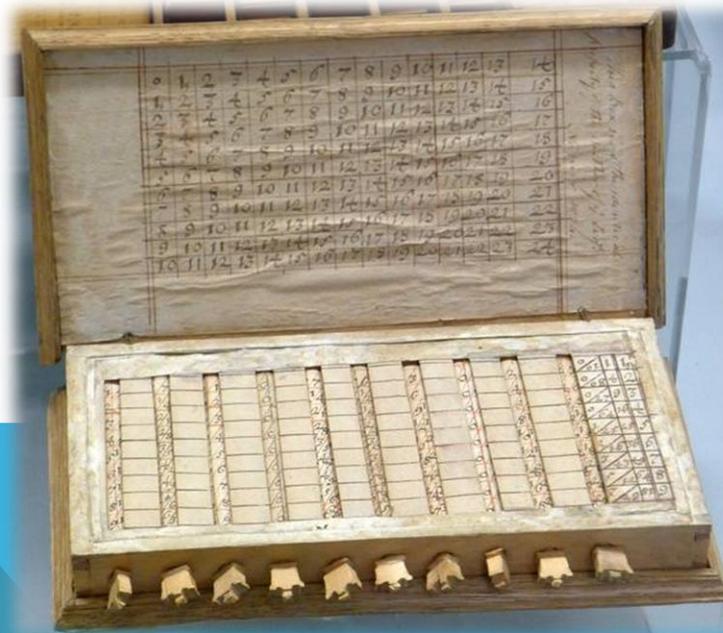
PRE-HISTORY ERA

The Antikythera mechanism, a device used for registering and predicting the motion of the stars and planets, is dated to 1st century B.C.



MECHANICAL ERA

John Napier of Scotland invents logs in 1614 to allow multiplication and division to be converted to addition and subtraction.



MECHANICAL ERA

Wilhelm Schickard, a professor at the University of Tübingen, Germany builds a mechanical calculator in 1623 with a 6-digit capacity. The machine worked, but it never makes it beyond the prototype stage.



MECHANICAL ERA

Leonardo Da Vinci is now given credit for building the first mechanical calculator around 1500. Evidence of Da Vinci's machine was not found until papers were discovered in 1967.



MECHANICAL ERA

Blaise Pascal builds a mechanical calculator called Pascaline in 1642 with an 8-digit capacity. The Pascaline was only able to do addition with ease.



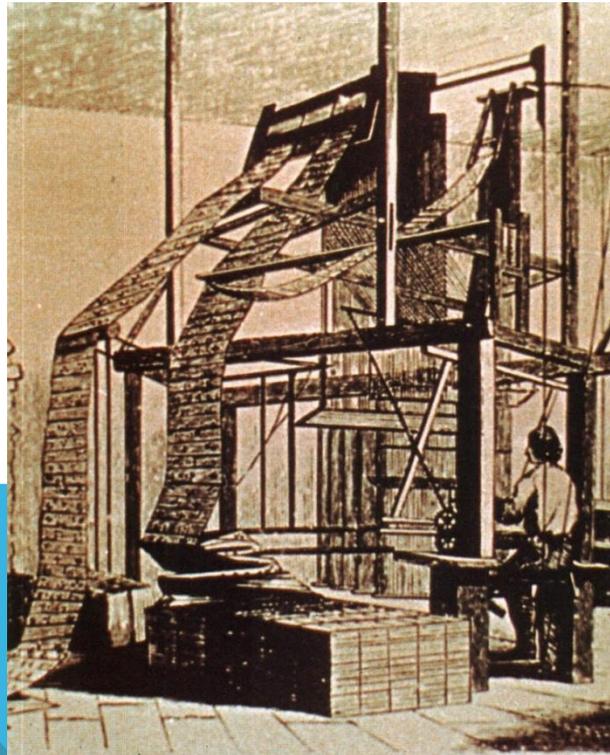
MECHANICAL ERA

Gottfried Leibniz – (1617) invented **Stepped Reckoner** that could multiply 5 digit and 12 digit numbers yielding up to 16 digit numbers.



MECHANICAL ERA

Joseph-Marie Jacquard invents an automatic loom controlled by punch-cards in the early 1800s.



MECHANICAL ERA

Charles Xavier Thomas de Colmar -1820 – developed **Arithmometer** (the first mass produced calculator).



MECHANICAL ERA

Charles Babbage designs a “**Difference Engine**” in 1820 or 1821 with a massive calculator designed to print astronomical tables. The British government cancelled the project in 1842. Babbage then conceives the “**Analytical Engine**”, a mechanical computer that can solve any mathematical problem and uses punch-cards.



Difference Engine



Analytical Engine

MECHANICAL ERA

Augusta Ada Byron, Countess of Lovelace and daughter of English poet Lord Byron, worked with Babbage and created a program for the Analytical Engine.

Ada is now credited as being the 1st computer programmer.



MECHANICAL ERA

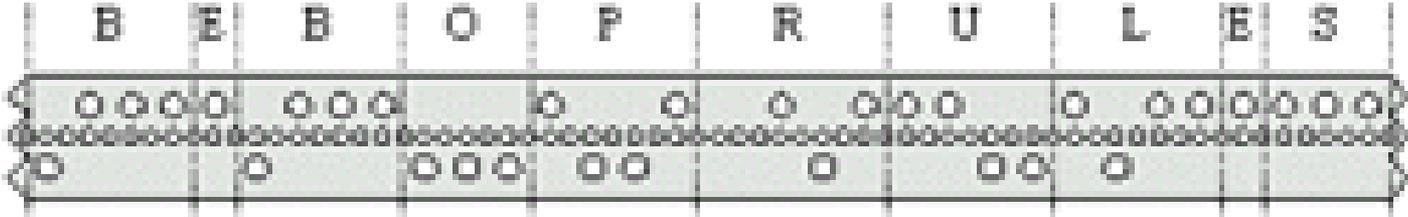
Samuel Morse invents the Electric Telegraph in 1837.

George Boole invents **Boolean Algebra** in the late 1840s. Boolean Algebra was destined to remain largely unknown and unused for the better part of a century, until a young student called Claude E. Shannon recognized its relevance to electronics design.



MECHANICAL ERA

In 1857, only twenty years after the invention of the telegraph, Sir Charles Wheatstone (the inventor of the accordeon) introduced the first application of paper tapes as a medium for the preparation, storage, and transmission of data.



MECHANICAL ERA

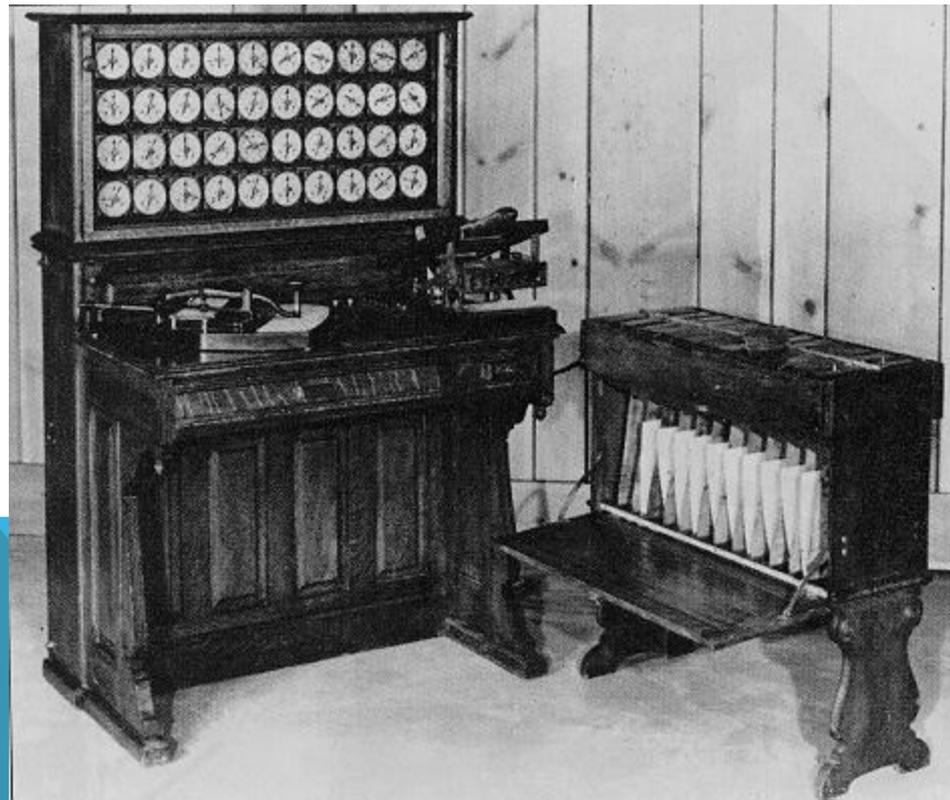
The first practical **typewriting machine** was conceived by three American inventors and friends, Christopher Latham Sholes, Carlos Glidden, and Samuel W. Soule who spent their evenings tinkering together.

The friends sold their design to Remington and Sons, who hired William K. Jenne to perfect the prototype, resulting in the release of the first commercial typewriter in 1874.



MECHANICAL ERA

Herman Hollerith's Tabulating Machines were used for the 1890 census; the machines used Jacquard's punched cards.



ELECTRONICS ERA

In 1926, Dr. Julius Edgar Lilienfield from New York filed for a patent on a transistor.

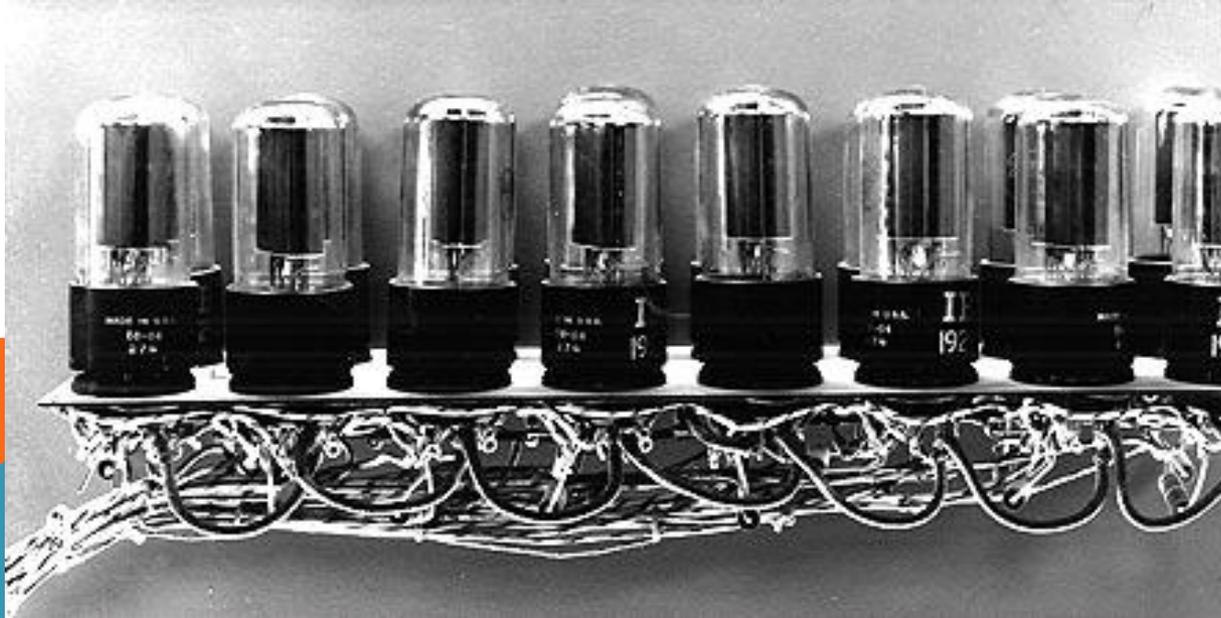
Konrad Zuse, a German engineer, completes the 1st general purpose programmable calculator in 1941.



ELECTRONICS ERA

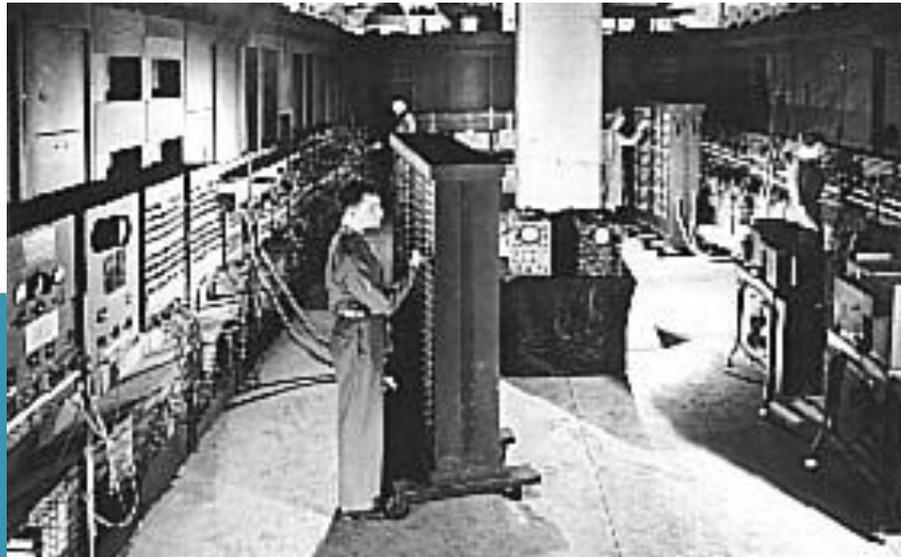
First Generation of computer.

It is the era of vacuum tubes. The computers of this era were huge, very expensive, slow and had limited application capabilities.



ELECTRONICS ERA

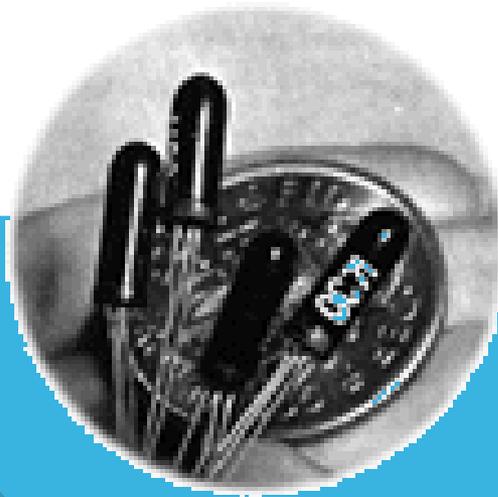
ENIAC (Electronic Numerical Integrator Analyzor and Computer) is developed by Ballistics Research Lab in Maryland and built by the University of Pennsylvania and completed in 1945.



ELECTRONICS ERA

Second Generation of Computer

The vacuum tubes were replaced by **transistors**. The invention of transistor allowed computer to become smaller, faster and cheaper. These computer also were more efficient and more reliable than the computers of the first generation.



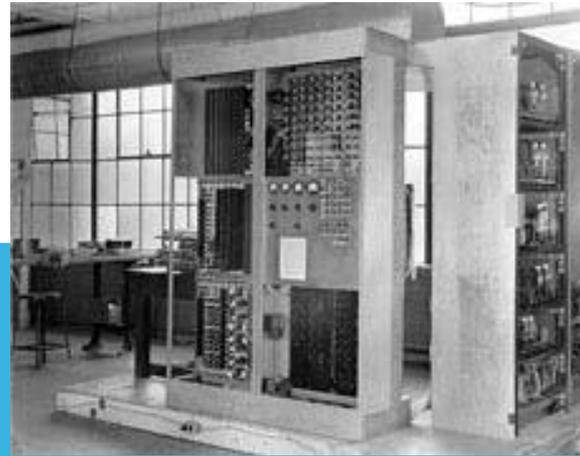
ELECTRONICS ERA

UNIVAC (Universal Automatic Computer) is developed in 1951 and can store 12,000 digits in random access mercury-delay lines.

EDVAC (Electronic Discrete Variable Computer) is completed for the Ordnance Department in 1952.



UNIVAC



EDVAC

MINI ERA

Third Generation of Computer

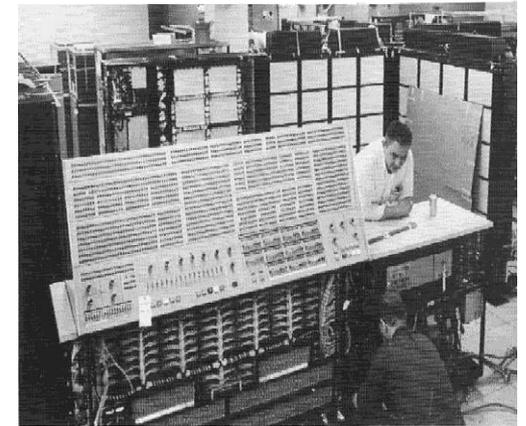
The appearance of **integrated circuits** allowed to place miniaturized transistors on silicon chips. This technological invention allowed computers to increase speed and to become more efficient.



MINI ERA

Texas Instruments and Fairchild Semiconductor both announce the integrated circuit in 1959.

The IBM 360 is introduced in April of 1964 and quickly becomes the standard institutional mainframe computer. By the mid-80s the 360 and its descendents have generated more than \$100 billion in revenue for IBM.



MINI ERA

The Mini Era began with the development of the integrated circuit in 1959 by Texas Instruments and Fairchild Semiconductor.

Ivan Sutherland demonstrates a program called Sketchpad (makes engineering drawings with a light pen) on a TX-2 mainframe at MIT's Lincoln Labs in 1962.



MINI ERA

Doug Engelbart demonstrates a word processor in 1968.

Also in 1968, Gordon Moore and Robert Noyce founded a company called Intel.

Xerox creates its Palo Alto Research Center (Xerox PARC) in 1969.

Fairchild Semiconductor introduces a 256-bit RAM chip in 1970.

In late 1970 Intel introduces a 1K RAM chip and the 4004, a 4-bit microprocessor. Two years later comes the 8008, an 8-bit processor.



MICRO ERA

Fourth Generation of Computer

Microprocessor is a device that have thousand integrated circuits (millions of transistors) built in one silicon chip.

The greatest thing in computer evolution was that the whole computer that in first generation filled the whole room, now was integrated into a small chip.



MICRO ERA

Bill Gates and Paul Allen form Traf-O-Data in 1971 to sell their computer traffic-analysis systems.

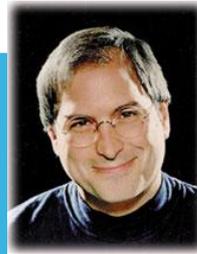
Gary Kildall writes PL/M, the first high-level programming language for the Intel Microprocessor.

Steve Jobs and Steve Wozniak are building and selling “blue boxes” in Southern California in 1971.

Intel introduces the 8008, the first 8-bit microprocessor in April of 1972.



Bill Gates



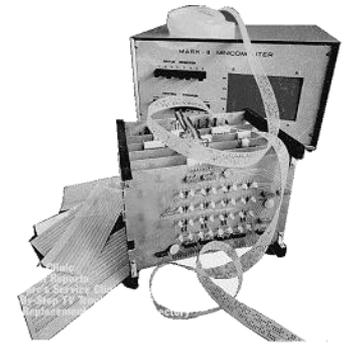
Steve Jobs

MICRO ERA

Jonathan A. Titus designs the Mark-8 and is featured in the July 1974 *Radio Electronics*.

In January 1975 *Popular Electronics* features the MITS Altair 8800; it is hailed as the first “personal” computer.

Paul Allen and Bill Gates develop BASIC for the Altair 8800. Microsoft is born!!!



Mark-8
Prototype

MICRO ERA

Apple is selling its Apple II for \$1,195, including 16K of RAM but no monitor by 1977.

Software Arts develops the first spreadsheet program, Visicalc by the spring of 1979. 500 copies per month are shipped in 1979 and sales increase to 12,000 per month by 1981.

By 1980 Apple has captured 50% of the personal computer market.



Apple II - 1977

MICRO ERA

In 1980 Microsoft is approached by IBM to develop BASIC for its personal computer project. The IBM PC is released in August, 1981.

The Apple Macintosh, featuring a simple graphical interface using the 8-MHz, 32-bit Motorola 68000 CPU and a built-in 9-inch B/W screen, debuts in 1984.

Microsoft Windows 1.0 ships in November, 1985.

Microsoft's sales for 1989 reach \$1 billion.



IBM PC - 1981

NETWORK ERA

Timesharing, the concept of linking a large numbers of users to a single computer via remote terminals, is developed at MIT in the late 50s and early 60s.

Paul Baran of RAND develops the idea of distributed, packet-switching networks.

ARPANET goes online in 1969.

Bob Kahn and Vint Cerf develop the basic ideas of the Internet in 1973.



NETWORK ERA

In 1974 BBN opens the first public packet-switched network – Telenet.

A UUCP link between the University of North Carolina at Chapel Hill and Duke University establishes USENET in 1979.

TCP/IP (Transmission Control Protocol and Internet Protocol) is established as the standard for ARPANET in 1982.



NETWORK ERA

The number of network hosts breaks 10,000 in 1987; two years later, the number of hosts breaks 100,000.

Tim Berners-Lee develops the World Wide Web. CERN releases the first Web server in 1991.

By 1992, the number of network hosts breaks 1,000,000.

The World Wide Web sports a growth rate of 341,634% in service traffic in its third year--1993.



WEBSITES

<http://www.pbs.org/nerds/timeline>

<http://www.maxmon.com/history.htm>

<http://ei.cs.vt.edu/~history/>

<http://www.cybergeography.org/atlas/historical.html>

<http://www.computerhistory.org>