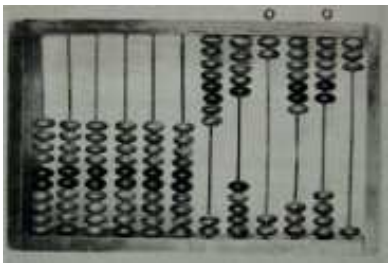
# CSE 241
*History of Computing*

**The Mechanical Age**

- 5000 BC
  - ☞Abacus
  - ☞Mechanical
  - ☞Still used today in the Far East.



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- 1621
  - ☞Slide Rule
  - ☞William Oughtred

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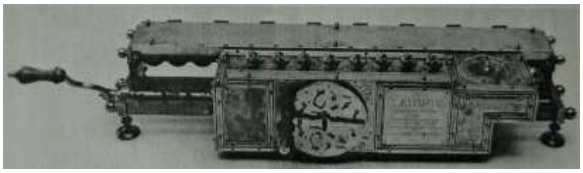
- 1642
  - ☞Adding machine using geared wheels
  - ☞Blaise Pascal

- Leibntz Calculator - 1673
  - ☞Baron Gottried Wilhelm von Leibnitz
    - ↳Expanded Pascal's calculator
      - ✓Incorporated multiplication & division



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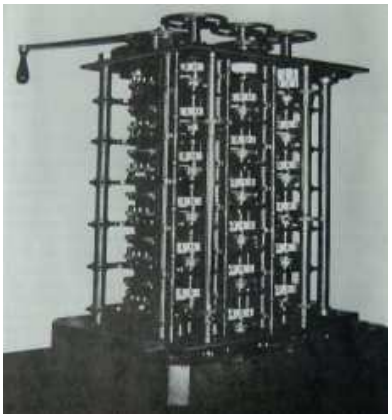
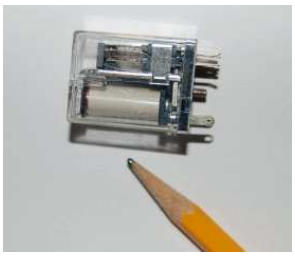
- 1833
  - ☞Difference Engine
  - ☞Charles Babbage
  - ☞Polynomial evaluation
  - ☞Designed mechanical machine resembling modern computers
    - ↳Could not be built at the time
    - ↳Precision required for gears were beyond the capabilities of the time.



Rick Decker and Stuart Hirshfield, *The Analytical Engine - An Introduction to Computer Science Using the Internet*, PWS Publishing Company, 1998, Figure 1.2, page 8

**The Early Electronic Age**



- Late 1930's
  - ☞Automated adding machine used electromagnetic relays.
  - ☞Howard Aiken (Howard University) & George Slibitz (Bell Telephone Laboratories)
- Early 1940's
  - ☞More electromagnetic computers developed
  - ☞Large & slow, but showed promise for electronic computers.

**The First Generation Computers**

- Electronic Numerical Integrator And Calculator (ENIAC)
  - ☞1945
  - ☞John Mauchly & J. Presper Eckert Jr.
    - ↳University of Pennsylvania
  - ☞18,000 vacuum tubes

Rick Decker and Stuart Hirshfield, *The Analytical Engine - An Introduction to Computer Science Using the Internet*, PWS Publishing Company, 1998, Figure 1.3, page 14

- UNIVAC
  - ☞Universal Automatic Computer
  - ☞1951
  - ☞48 constructed
  - ☞First Commercial Digital Computer
- Downfalls:
  - ☞Very large
  - ☞High failure rate
  - ☞Consumed a large amount of power
  - ☞Difficult to program
    - ↳ Plugboard required

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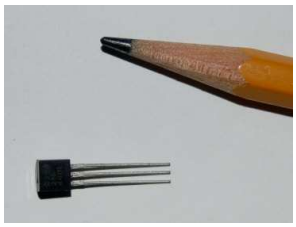
- The ENIAC led to the following discoveries:
  - ☞Transistor
    - John Vardeen, Walter Brattain, William Shokley
    - Reduced size & power consumption by replacing vacuum tubes
  - ☞Magnetic Core Memory
    - J.W. Forrester & Associates (MIT)
    - Provided mechanism for storing large amounts of data
  - ☞Programs & data should reside together in memory
    - John von Neumann
    - Allowed for easy modification of programs



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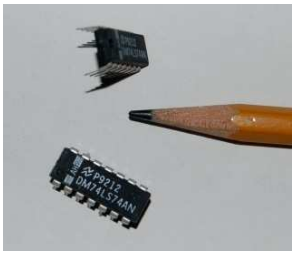
**The Second Generation Computers**

- Late 1950's & 1960's
- New Technology:
  - ☞Transistors
- Smaller, faster, increased capability

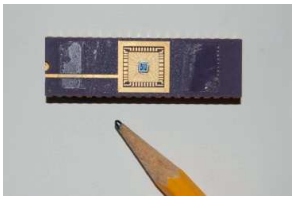
**The Third Generation Computers**

- Late 1960's & 1970's
- New Technology:
  - ☞Integrated Circuits (ICs)
    - ↳Multiple transistors on a single circuit
    - ↳Increased speed & reduced size
- Advances in memory capacity & packaging also contributed.
- Minicomputer emerged
  - ☞1960's
  - ☞Smaller, limited capability, more general purpose machines compared to the more common mainframes of the time.
  - ☞Increase computer usage among the scientific & engineering communities.



**The Fourth Generation Computers**

- Late 1970's → ???
- New technology:
  - ☞LSI (Large Scale Integration)
  - ☞VLSI (Very Large Scale Integration)
- Microprocessor emerged
- PCs & workstations emerged
- Computers came to be used by more than just computer experts.



**The Fifth Generation Computers**

- Have we entered the fifth generation?
  - ☞No defining technology development as the triggering events of the past.

**References**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