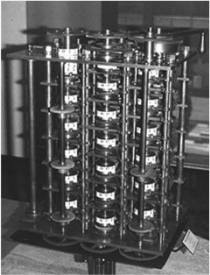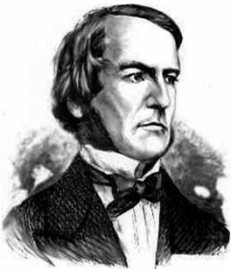# TECH 3233

Lecture 1

Computer History

University of Memphis
Assistant Professor
Daniel Kohn

1

1822 – Charles Babbage

- Difference Engine
- All Mechanical "Computer"
- Capable of performing complex calculations not exceeded until the 20th Century.
- Analytical Engine

2

1854 – George Boole

- Boolean Algebra
- AND, OR, NOT, TRUE/FALSE
- All modern day computers work on his principles

3

1904 – First Vacuum Tube

- Invented by John Fleming
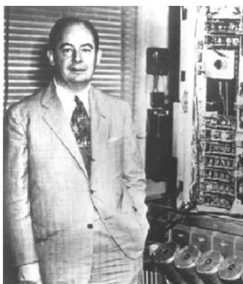- Shown is the first diode vacuum tube

4

1930 – First Analog Computer

- Made with tube op-amps
- Calculations were done feeding in analog signals and voltages
- Outputs were either on o-scopes, volt meters or chart recorders
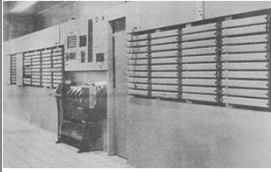- Hard wired – hours to set up one calculation

5

1943 – Von Neumann

- Credited with the idea of storing programs in what we call RAM

6

1944 – Electromechanical Computer

- Based on Relays
- Slow and Unreliable

7

7

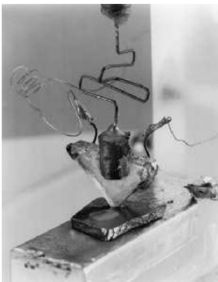## 1946 – Electronic Numerical Integrator and Computer (ENIAC)

- First All Electronic Computer
- 30,000 Vacuum Tubes
- 47 Panels
- Made to calculate trajectories for artillery shells.

8

8

1947 - Transistors

- Bell Labs
- Almost every electronic device built today has transistors inside!
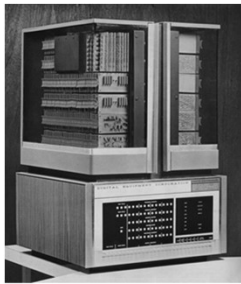
9

9

1956 - Fortran

- Fortran – FORmula TRANslation
- First High Level Computer Programming Language
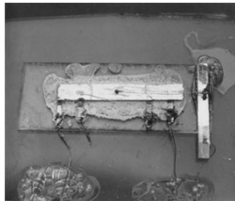
10

10

1961 – PDP-8

- First Successful Minicomputer
- Made by Digital Equipment Corporation
- 4K of 18bit words
- $120,000

11

11

1964 – Integrated Circuit

- First circuit to be made out of one piece of germanium.

12

12

1968 – Block I

- Apollo Spacecraft computer
- 20 op codes
- 30K ROM
- 2K RAM
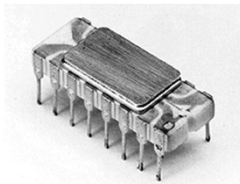- 2.048 MHz
- Weight – 20 lbs

13

13

1969 – ARPANET

- Forerunner of the Internet
- First network was established between
  - UCLA
  - Stanford
  - University of California at Santa Barbara
  - University of Utah

14

14

1971 – Intel 4004

- First microprocessor
- 4 bit CPU
- 4K Max external Memory
- 45 Op Codes
- 108 KHz
  - 60,000 instructions per second
- 2300 transistors

15

15

1971 – Intel 8008

- First 8 bit microprocessor
- 16K max external memory
- 48 op codes
- 108 KHz
- 3500 Transistors

16

16

1973 – Intel 8080

- 8 bit microprocessor
- 16 bit address bus (max 64K External memory)
- 6000 Transistors

17

17

1975 - Altair

- Produced by MIT
- First Personal Computer
- 8080 Processor
- $400 in kit form

18

18

1977 – Intel 8085

- 5MHz clock speeds
- 6500 transistors
- Improvements over 8080
  - Single Voltage source
  - Serial communications
  - Needed fewer support IC's

19

1977 – APPLE II

- First computer with color graphics
- Expandable with card slots

20

1978 – Intel 8086

- 10MHz
- 16 bit data bus
- 24 bit address bus
- 10MHz
- 29,000 Transistors

21

1979 – Intel 8088

- Similar to 8086 but uses multiplexing to create a 16 bit data bus on 8 actual lines.

22

22

1980 – Motorola 6800

- Intel is not the only one producing microprocessors, Motorola is also producing them.

23

23

1981 – IBM XT

- 8088 CPU
- First widely used PC
- DOS operating system
- Standardized ports, expansion slots…..

24

24

1982 – Intel 80286

- 16MHz processor
- 134,000 Transistors
- 16 bit data bus
- 24 address bus

25

25

1984 – IBM AT

- Based on 80286 Processor

26

26

1985 – Intel 80386

- 32 bit data bus
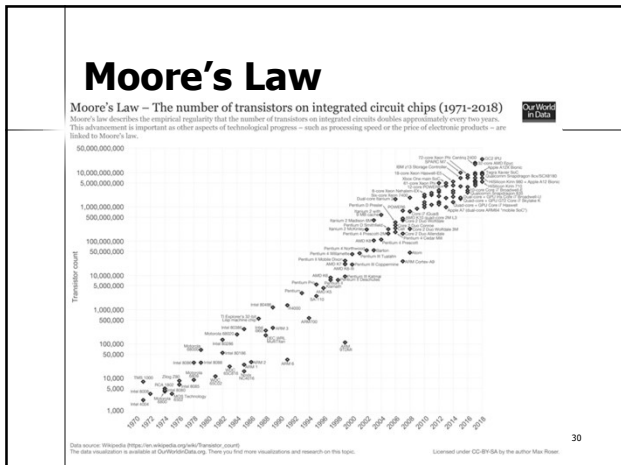- 32 bit address bus
- 50 MHz
- 275,000 Transistors

27

27

1989 – Intel 80486

- Improved version of '286
- 100 MHz
- 1.2 Million Transistors

28

~1991 – Internet Goes Public

- The Clinton administration decides to allow private citizens on the internet backbone. Up until this point it was used mostly by researchers involved in government projects.

29

Moore's Law

Moore's Law – The number of transistors on integrated circuit chips (1971-2018)

30

Bibliography

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- http://lifeboat.com/images/moores.law.technological.evolution.jpg
- https://en.wikipedia.org/wiki/Moore%27s_law

31

31