CPE 315
Computer Architecture

Prof. Dave Retz

Lab and HW Handins

- Methods:

  a) By Hand

  b) Submit by Polylearn assignment portal
- See Lab Report Guidelines on Polylearn
- Be sure to Follow Cover Sheet format, including ALL team member names
- Due by Midnight of Due Date
- Late Submissions: 1 point per day, unless specially arranged/excused.

Tips

- Class Participation: Don’t be afraid to ask questions or actively participate.
- Your questions are helpful; better to “ask now” than be confused later.
- Involvement helps remember details.
- “90% of life is just showing up.” – woody allen

Test Tips

- Read the question and answer it and all of the components of it. If there are more than one item requested, make sure to answer each.
- Answer ALL questions. Ieven if you're stuck, show some partial work. Never leave a question blank.
- Make sure your name is on your test.
- Write neatly and clearly if possible, put your answer in a little box .

What is Architecture ?

- The design and construction according to some **framework** or system.

- Involves design choices based on **needs** and **economics**.

A definition of Computer Architecture

- “a specification detailing how software and hardware technology interact to form a computer system.
- “The art of determining the needs of the user/system and creating a logical design and standards based on those requirements.”

Design Factors

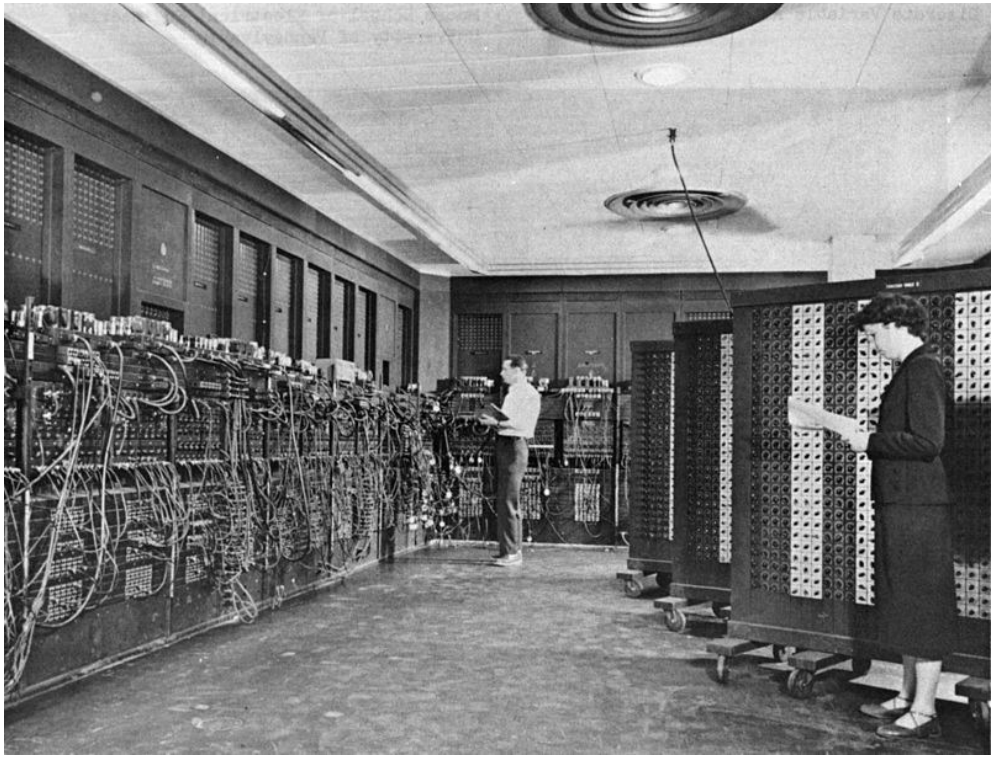
- Performance
- Reliability
- Security
- Maintainability
- Energy Use
- Size
- Cost

Instigators of Change

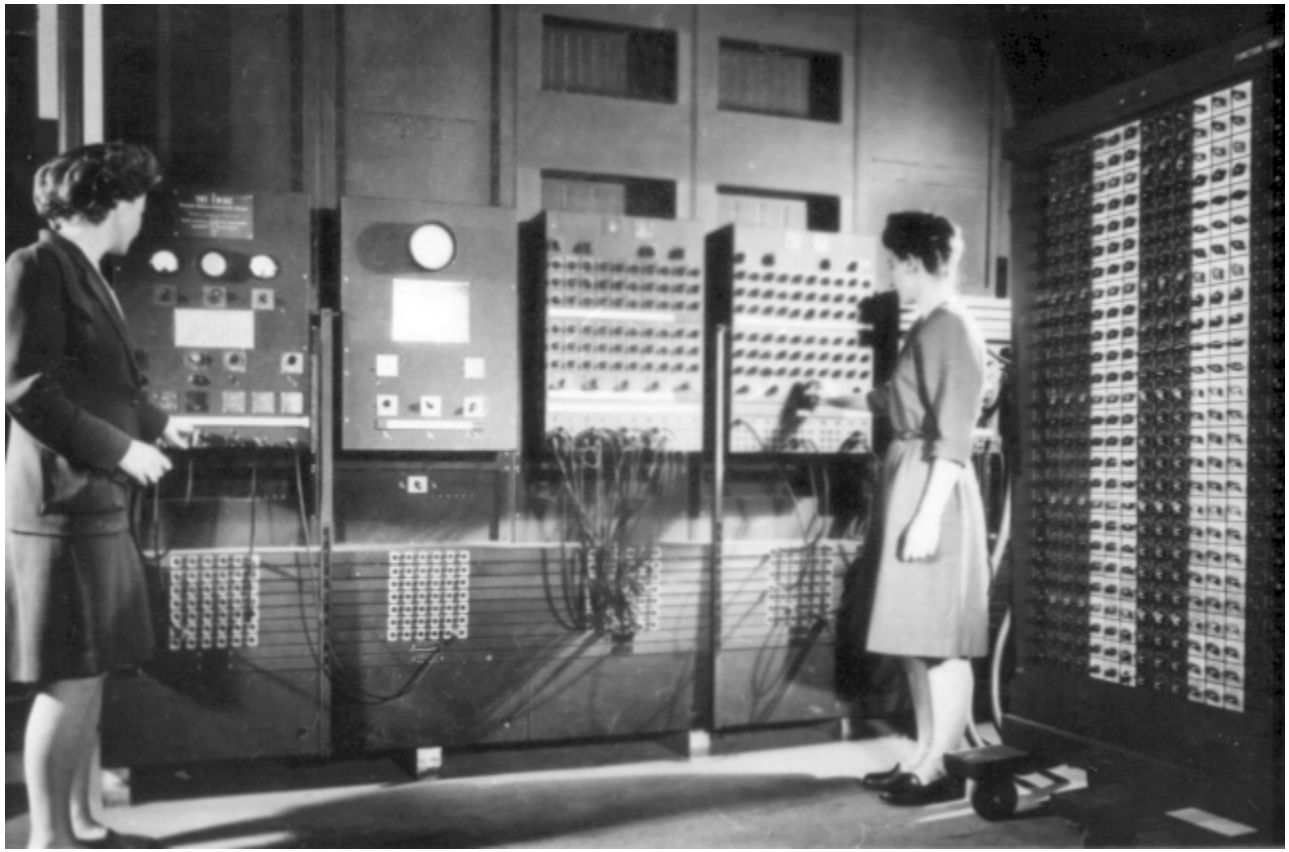
- Free Market
- Need for Survival
- Government

Survival

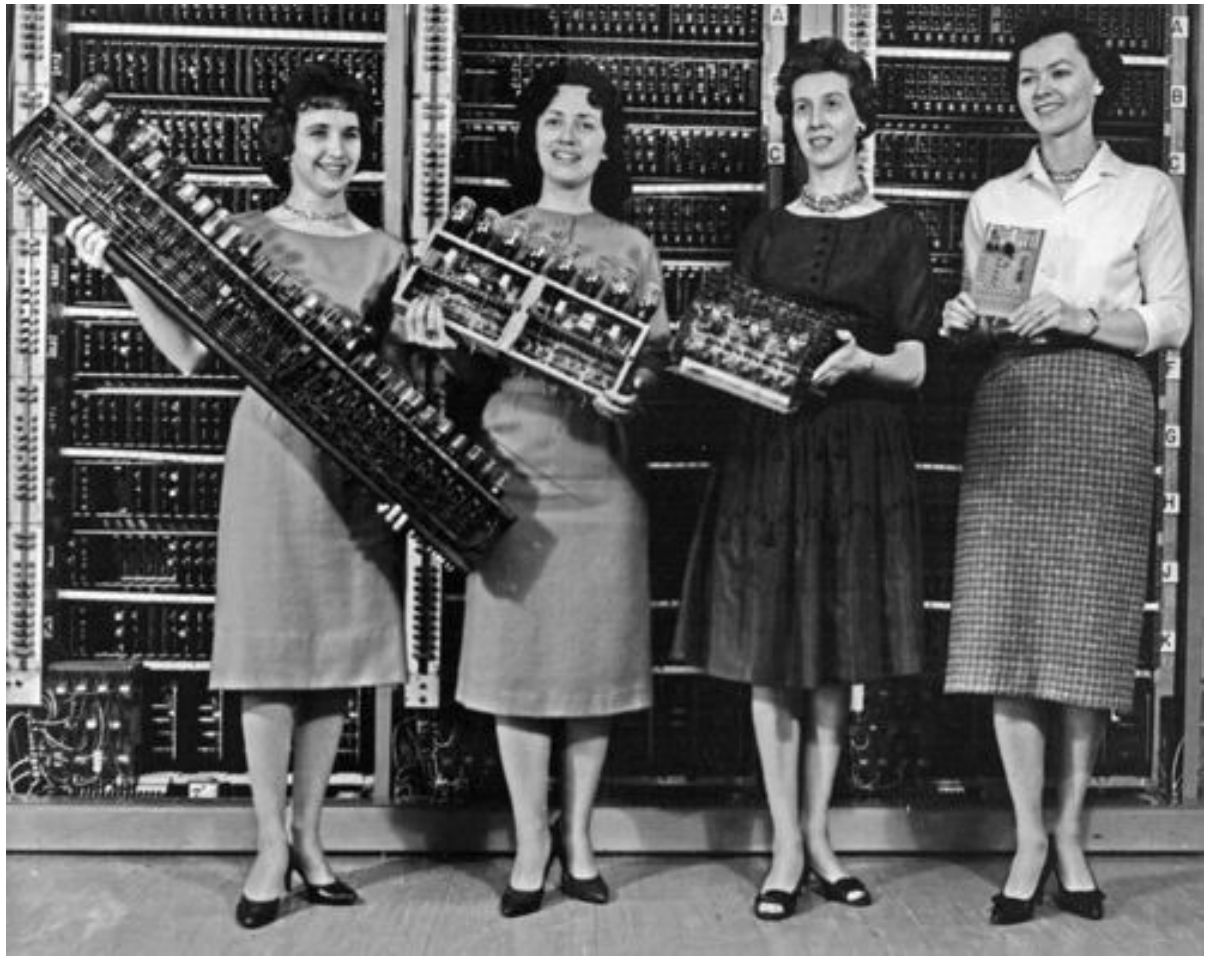
- ENIAC, EDVAC 1940’s



Programming Teams



Easily Swappable Boards



Centralized Computing

Dominated by IBM (1950's – 1980's)

Peripheral Contributors

- DEC (Flip – Chip products) 1957 – 1968
- “What doesn’t exist now won’t be available ten years from now.” -Ken Olsen, DEC CEO

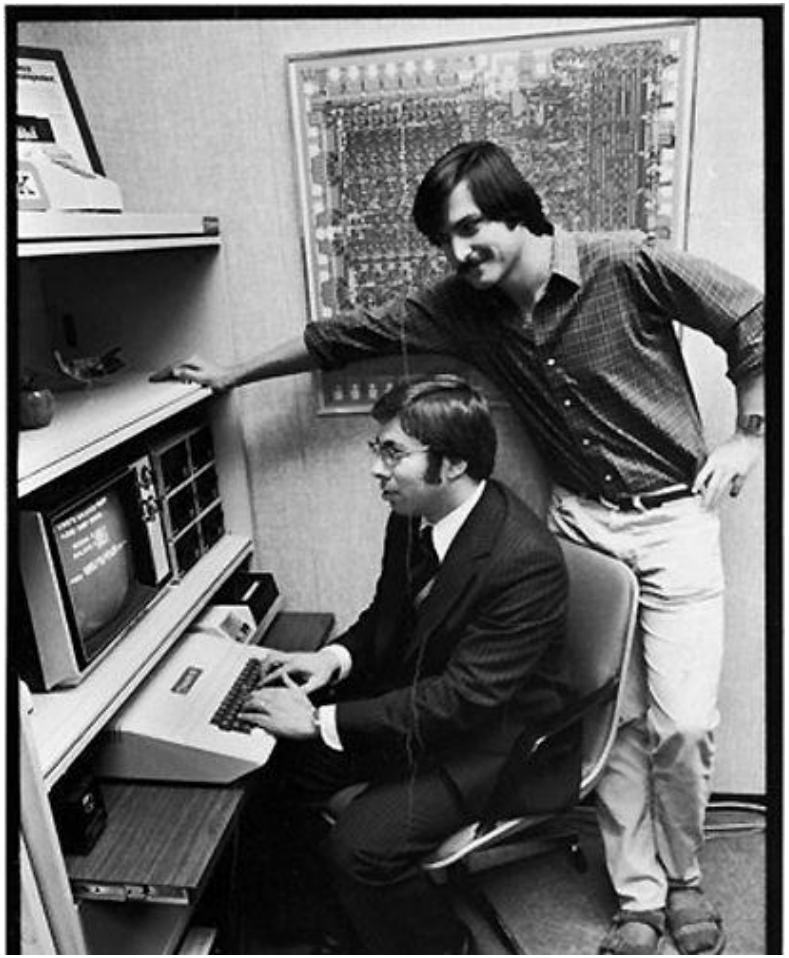
Minicomputer era (1970-1980)

Workstations

- Late ‘70s : Xerox ALTO; SRI Mouse with keypad.

New Apps for Minis :: Unix

Homebrew in River City



“No Market for This”

Enablers

- 1974-1978 Intel and others introduce processors.

DARPA VLSI Project

Early 1980's:

- Sponsors Berkeley RISC (SPARC) Patterson
- Sponsors Berkeley Unix Development (BSD)
- Sponsors Stanford RISC (MIPS) Hennessy

Timeline

- ‘50s – ’60s – Mainframes Dominate
- ‘70s: – Minicomputers introduced;
- Experimental Workstations (ALTO)
- Ethernet (and competitors)
- ‘80s: - PC’s introduced
- TCP/IP becomes “standard”
- New workstations demand higher processor performance. (RISC)

Timeline, cont’d.

- ’90s – LANS are pervasive, Microsoft dominates
- 2000’s – Client/Server model predominates; Internet email/text/web access possible.
- 2010’s – Handheld devices predominate

Computer Architecture

- Processor (ISA)
- Memory
- I/O

Design Factors *

- Performance
- Reliability
- Security
- Maintainability
- Energy Use
- Size
- Cost

* (important !)