CSC104 fall 2012

Why and how of computing
week 2

Wikipedia due Friday — see web page

Danny Heap

heap@cs.toronto.edu

BA4270 (behind elevators)

http://www.cdf.toronto.edu/~heap/104/F12/

416-978-5899

Text: Picturing Programs

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Outline

Pre-modern computer

Notes

gears, pins, and electricity

digital and analog before tubes

Hollrith / IBM tabulator

pins that go through card touch a
mercury bath + transmit electricity.
information → accumulator and
rack pops open for card.

data stored in punched cards
manipulated by pins and
electricity last for decades

see video

Soviet model ~1928 performed integral calculus
model represented world economic trends
NZ analog computers model world
using smoothly-varying quantities
such as water

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programmable or electronic...

...but not both?

In WWII era, lots of money to break codes and track projectiles

In Germany Z1 → Z3 used slow, noisy electromechanical relays — only ran for a few hours

"programmable" (cards) but
not electronic (relays)
the Zuse Z1

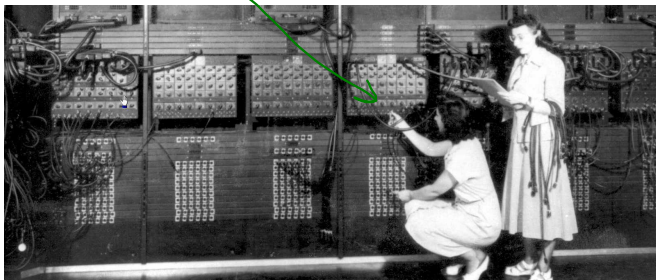In U.S; fore-runner of ENIAC program. had hard-wired

electronic but not programmable
dedicated to one calculation
the Atanosoff-Berry

when computers were women

for a while

ENIAC → thousands of tubes, big as a building

programmed by connecting with "jumper" wires

Eniac's first programmers were women
known for clear-thinking, manual dexterity, and speed
...human labour was cheaper than computer cycles
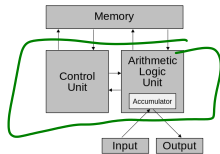dozens of cubic metres, programmed by connecting pins

for nearly a decade.

stored programs, faster switches

Von. Neumann architecture

CPU ≈

the same memory for data
and programs is now
the typical design

tube machines had to warm up,
error-prone, tubes burned out

tubes were big, hot, slow
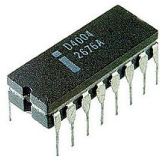compared to transistors
... which just keep shrinking

Moore's law

your (grand)parent's computer

smaller, faster, ...

hobbyists wanted these

But few people knew what to do with a home computer

perhaps thanks to sputnik

the computing power of eniac

fits in your hand by 1970

Word processors, Spreadsheets, games...

mass-produced desktops

landed with a clunk

by 1980s

Notes