

-Test: Nov 14 (really),

-office hours.

Next Friday (9th)
office 1-2
3-5

Thurs 8th

CSC104 fall 2012

Why and how of computing
week 8

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Text: **Picturing Programs**

Outline

operators and operating systems

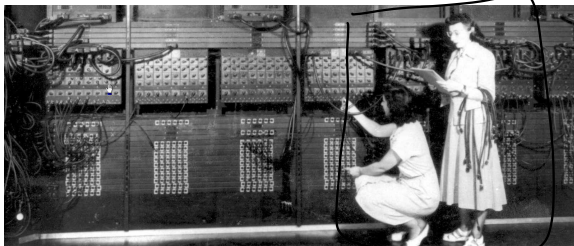
Notes

machines take over in batches

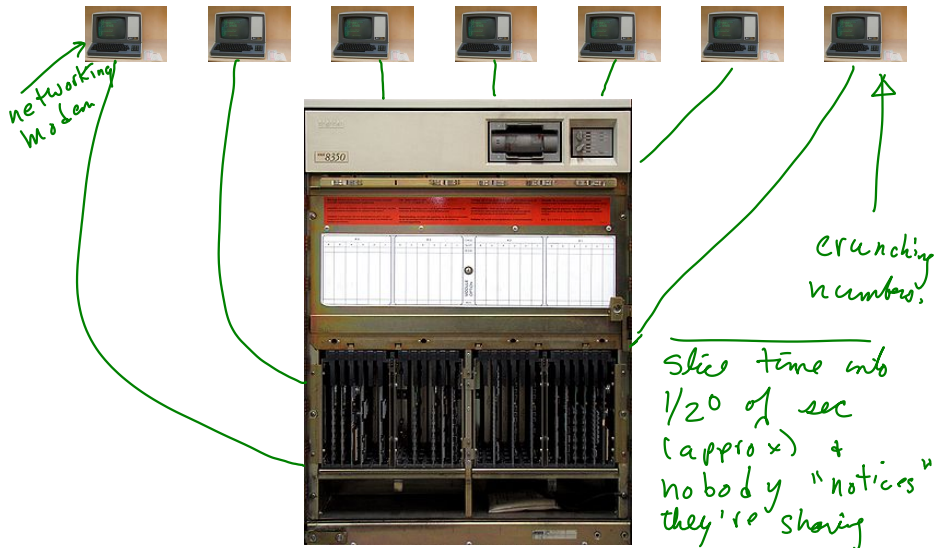
data paper cards, tapes, moved around,
fed to reader.

Machines began to take over setting the program counter to a new job, collecting the output, fetching memory... but it was still one job at a time.

batch processing



time sharing, version 0.1



one user, one program, one computer

- dedicated - just one job (games, typesetting)
- programmer knew all details disk access
- practically no op. sys needed.

IB XT



Apple II E



Commodore 64



"disk operating system to read/write hard drive & load programs"

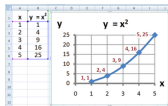
OS shields programmer & users from hardware details

(which disk sector am I reading, which mem location reading)

task-switching to time-splitting, v 1.0

revolution!

stop one task (temporarily)
start another.



→ by late 80s possibility of
time-sharing was here.

Does one task stop, or only appear to stop, for the other?

→ 1/20 second time slices.

unix (mostly) to the desktop

GUIs, time-sharing, networking, flame-wars

→ mainframes migrate

- several users, several programs.
- networking
- GUIs



↑
OS X
inherits from
BSD unix



↑
MS Windows
had unix-like
features NT forward



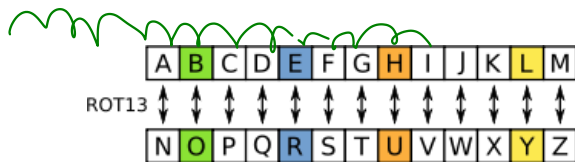
↑
linux
↓
BSD unix
ATT unix

an operating system should have

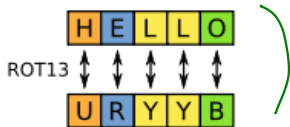
- ▶ kernel (shell, shielded access to hardware, resource sharing) $\sim 1/20$
 - ↳ user interacts with → clicking for most typing
- ▶ utilities — repair, maintain machines
 - list files
 - format disk.

a blast from the past

really bad text encryption



add 13 to A-M
Subtract 13 N-Z



Encrypt "STRING"

"FGEVAT"

move 13 lower in alphabet
add/subtract 13 modulo 26 (remainder)

rot13 as an algorithm

- ▶ What is given, what's required?

$\text{rot13}^{\text{string}}: \text{string} \rightarrow \text{string}$ } (map rot13 (string->list string))

- ▶ Redo the last step for a single character

$\text{rot13}: \text{char} \rightarrow \text{char}$

- ▶ What is a really simple rule (or set of rules) for $(\text{rot13 } c)$, where c is some character?

if c is in A-M, add 13
if c is in N-Z sub 13

- ▶ It might help to know that characters #\A through #\Z have ascii encodings 65 through 90.

more rot13

- ▶ What about characters that aren't in `#\A` through `#\Z`?
- ▶ What about lower-case characters?
- ▶ How do we get from characters to strings of characters?

reversing strings

Give step-by-step instructions to reverse "string"

"gnirts"
↓

- ▶ given/required?

$\text{string-reverse} : \text{string} \rightarrow \text{string}$

- ▶ check-expect some small examples?

"ab" \leftrightarrow "ba"

"a" \leftrightarrow "a"

"" \leftrightarrow ""

- ▶ try to write down a recipe

"ab" \rightarrow $(\text{string-append } (\text{string-reverse "b"}) \text{"a"})$

"abc" \rightarrow $(\text{string-append } (\text{string-reverse "bc"}) \text{"a"})$



How do you recognize a palindrome, such as “rotor” or “ACTAGATCA”?

- ▶ given/required?
- ▶ check-expect a small example or two
- ▶ try to state the recipe

Notes