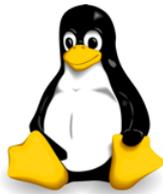




## CSCI 3310 OPERATING SYSTEMS

Sean Barker  
Bowdoin College



Department of Computer Science

## “Abstraction”

AN x64 PROCESSOR IS SCREAMING ALONG AT BILLIONS OF CYCLES PER SECOND TO RUN THE XNU KERNEL, WHICH IS FRANTICALLY WORKING THROUGH ALL THE POSIX-SPECIFIED ABSTRACTION TO CREATE THE DARWIN SYSTEM UNDERLYING OS X, WHICH IN TURN IS STRAINING ITSELF TO RUN FIREFOX AND ITS GECKO RENDERER, WHICH CREATES A FLASH OBJECT WHICH RENDERS DOZENS OF VIDEO FRAMES EVERY SECOND

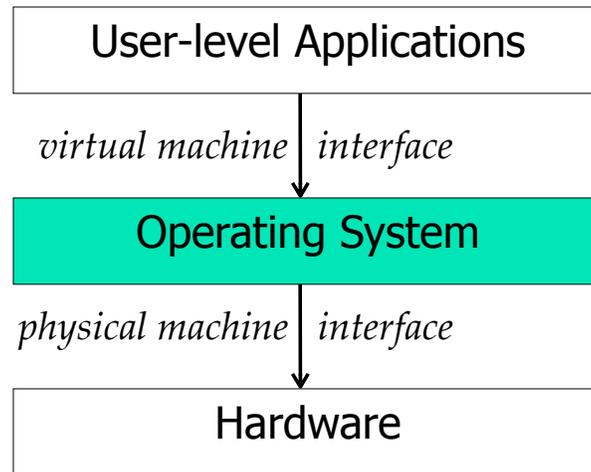
BECAUSE I WANTED TO SEE A CAT  
JUMP INTO A BOX AND FALL OVER.

I AM A GOD.



(source: xkcd.com)

# Top-Level View of an OS

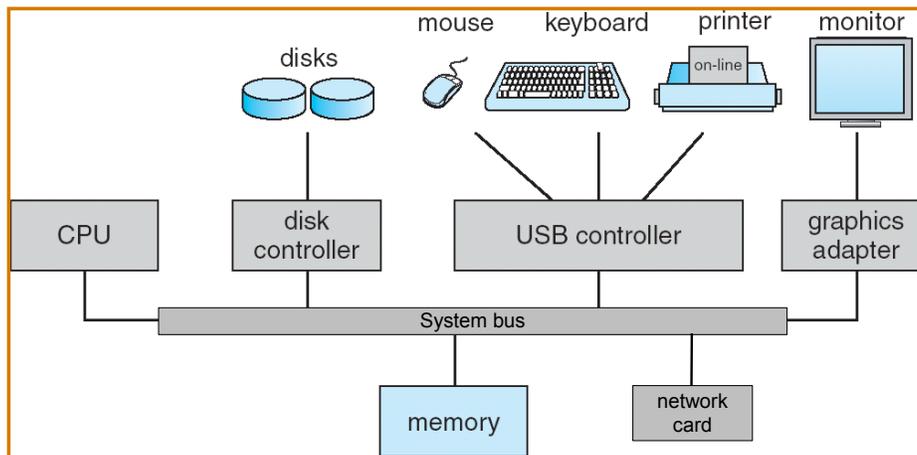


# What's in an OS?



“even a ham sandwich”  
(Steve Ballmer,  
former MS CEO)

# Generic Computer Architecture



## Personnel and Resources

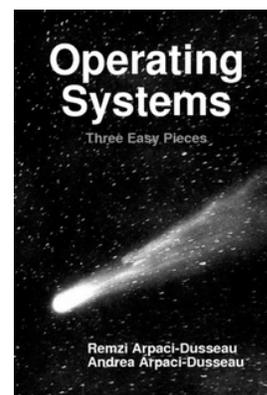
- Instructor: Sean Barker
- Email: [sbarker@bowdoin.edu](mailto:sbarker@bowdoin.edu)
- Office: Searles 220
- Research: smart buildings, distributed systems
  
- Piazza Q&A forum

## Course Components

- Projects (4)
- Written homework (3-4)
- Exams (2)
- In-class participation

## Other Administrivia

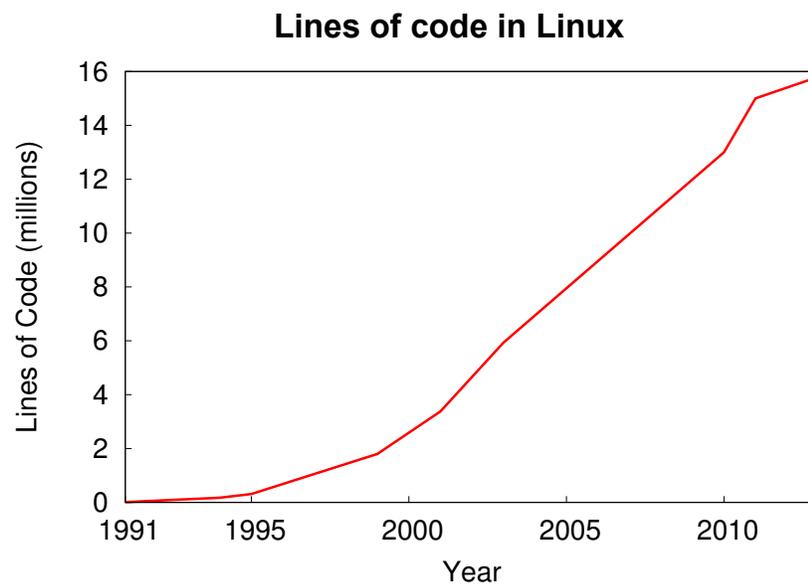
- Class meeting times
- Textbook
- Collaboration policy and honor code



## Go here!

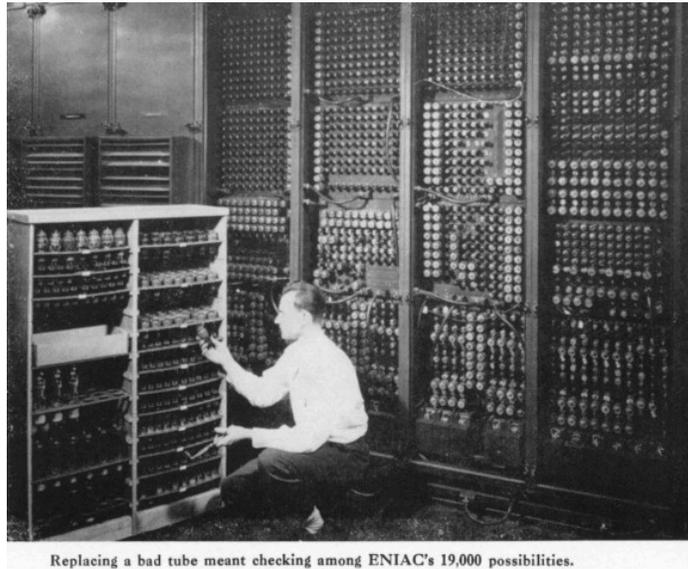
- Course web page:  
<http://www.bowdoin.edu/~sbarker/3310>

## Now for some history...



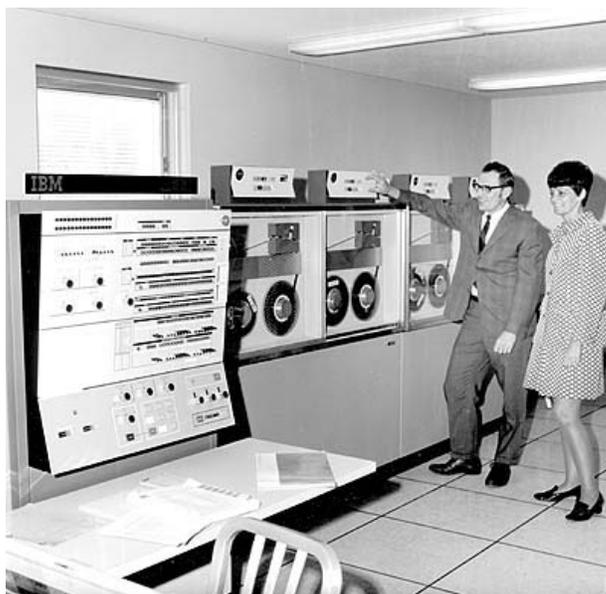
# 1. Single-User Computers (1945-55)

Vacuum tubes!

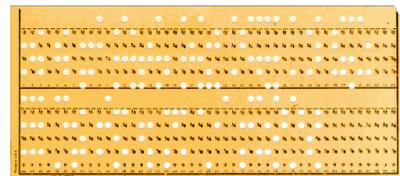


# 2. Batch Processing (1955-65)

Mainframes!



Punch cards!



### 3. Multiprogramming (1965-80)



Transistors!



Multiple programs concurrently

Simultaneous I/O and computation

### 4. Personal Computers (1980-present)



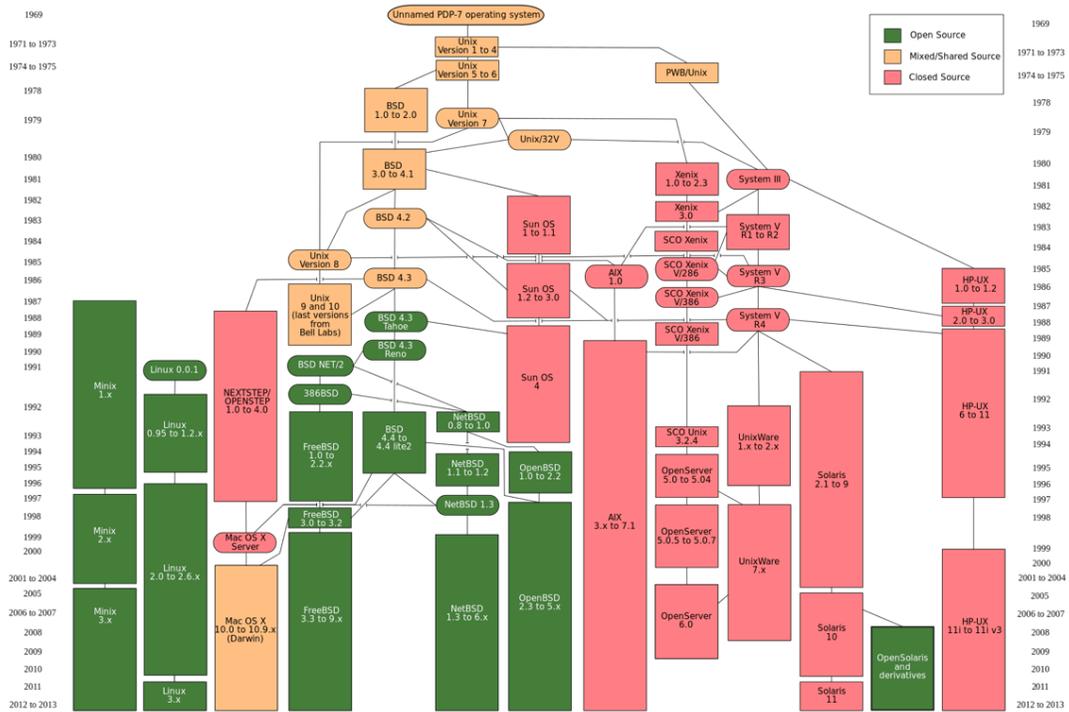
## 5. Mobile & Distributed (present-???)



## UNIX (1971)



# Unix and Unix-like OSes



# MS-DOS (1981)

```

Welcome to MS-DOS 2011

For a list of simple commands, please type HELP
>HELP

LOC - Displays the location of the currently operating program
OPEN <directory> - Opens and displays contents of the directory entered
EXECUTE <directory/filename> - Executes a file within that directory
REBOOT - Reboots current session <Confirmation will be required to prevent
accidental reboots>
SYS - Displays system properties
>RUN: person .EXE

What was that? I can't understand you.
>realityconfig

Attempting to configure your reality...
Enter password:
>^C to abort.

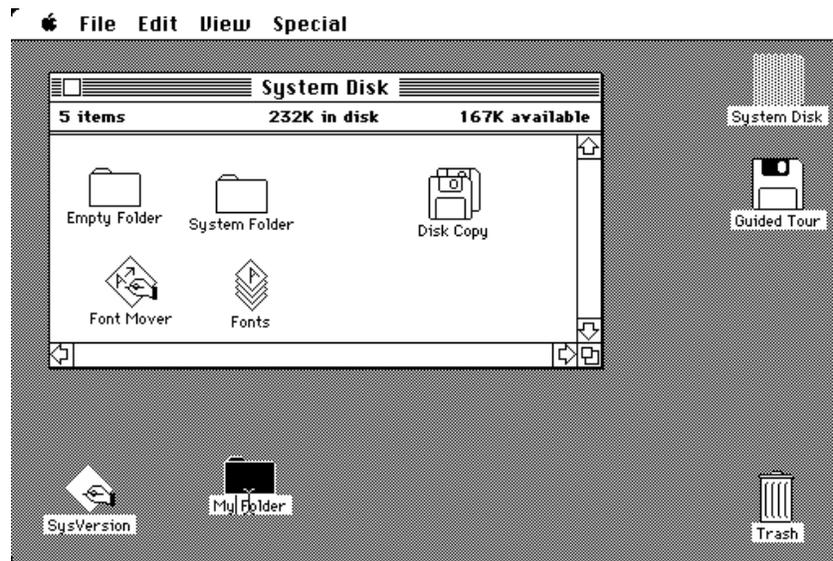
Incorrect password. Exiting function.
>SYS

Main Harddrive: Q:/
Space Used: 185246/6152374 KB
Processing Power: 10 GH
RAM: 3000000 KB
>OPEN GAMES

What are you, stupid? GAMES isn't a directory! Try Q:!/
>EXECUTE adventure.EXE

Try adding a directory to that, before you seem any less intelligent.
>_
    
```

# Mac OS (1984)



# Mac OS X (2014)



# Where are we going?

