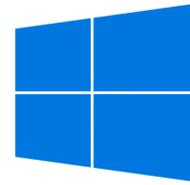


# Bowdoin



## CSCI 3310 OPERATING SYSTEMS

Sean Barker  
Bowdoin College



Department of Computer Science

# YouTube

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

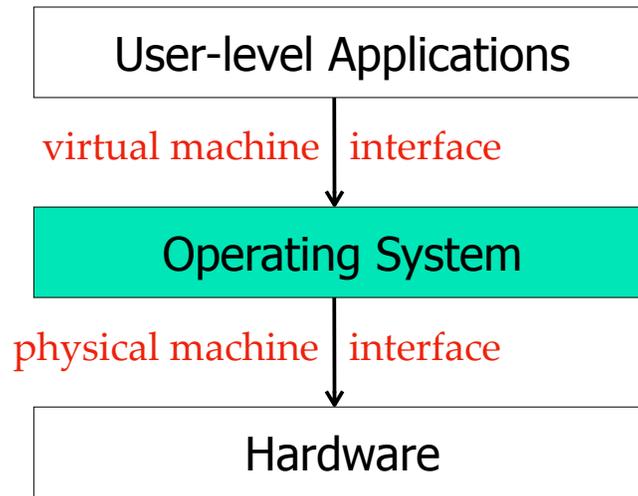
BECAUSE I WANTED TO SEE A CAT  
JUMP INTO A BOX AND FALL OVER.



I AM A GOD.

(source: xkcd.com)

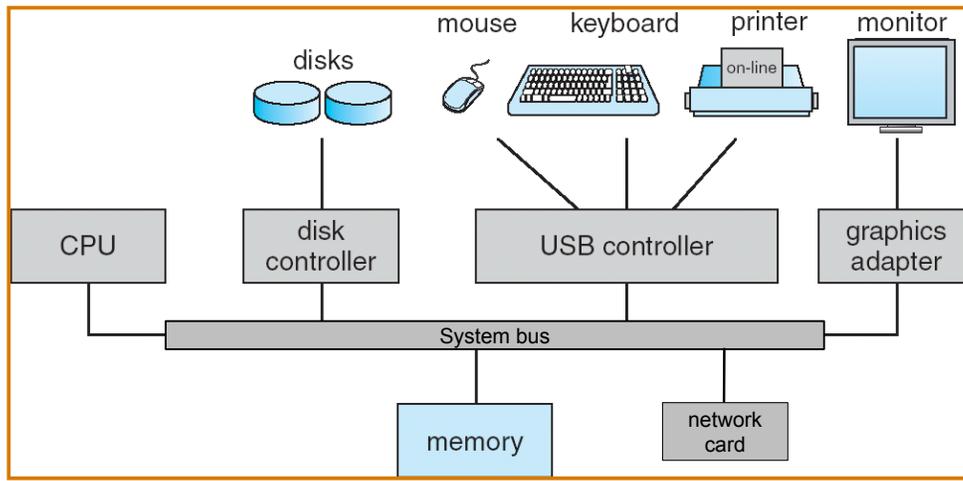
# Top-Level View of an OS



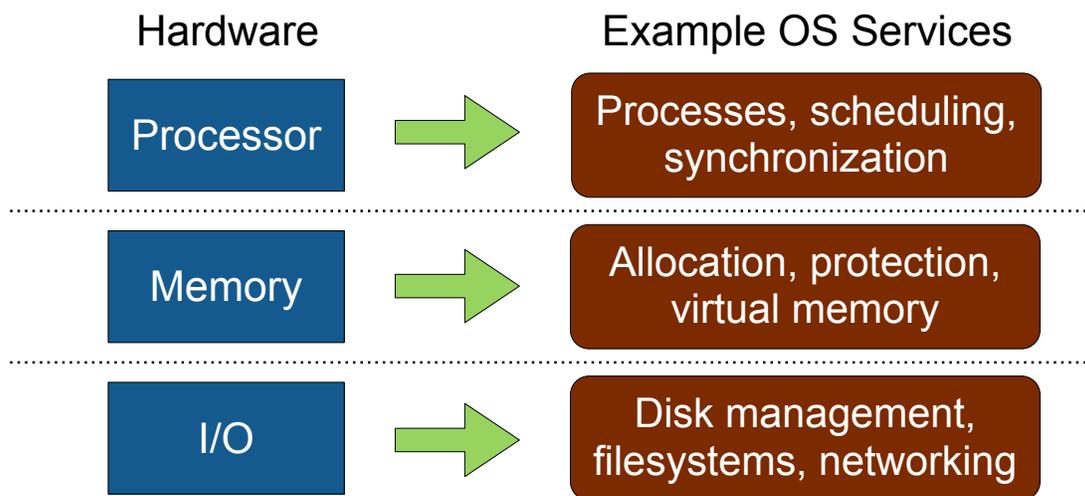
## What's in an OS?



# Generic Computer Architecture



# OS Resource Management



# Personnel and Resources

- Instructor: Sean Barker
- Email: [sbarker@bowdoin.edu](mailto:sbarker@bowdoin.edu)
- Office: Searles 220
  - Virtual Office Hours **TBA** (or by appointment)
- Research: smart buildings, energy, distributed systems
  
- Email **Slack** for discussions/questions/info...
  
- **Pre-Semester Survey** on Blackboard

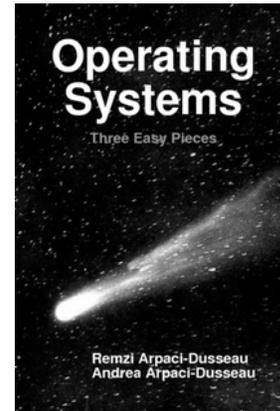
# Course Components

- Programming projects (4)
- Problem sets (3-4)
- Exams (2)
- Attendance and engagement

## Other Administrivia

- Class meeting times

- Textbook



- Collaboration policy and honor code

## Course Website

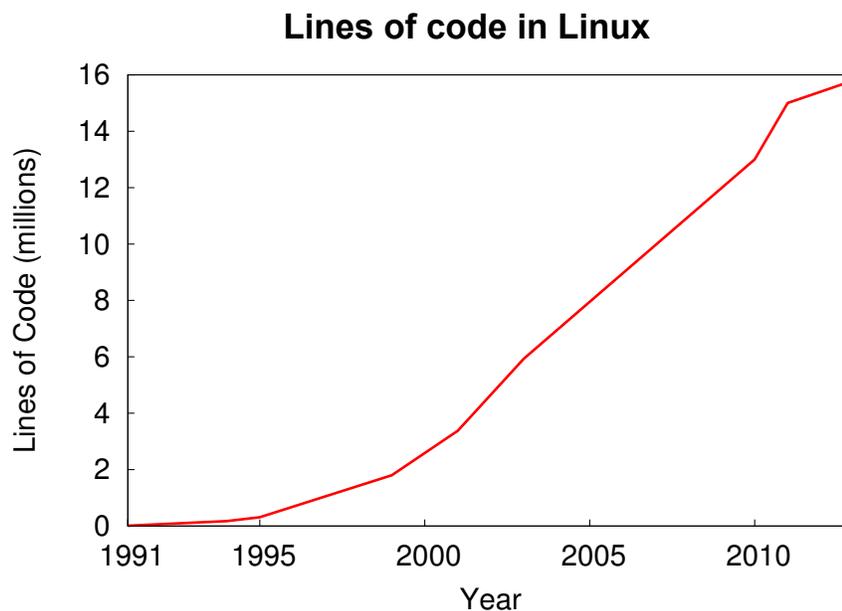
- Course website: [bowdoin.edu/~sbarker/3310](http://bowdoin.edu/~sbarker/3310)

- Syllabus
- Schedule
- Assignments
- Feedback (anonymous)

# Project 1: Inverted Index

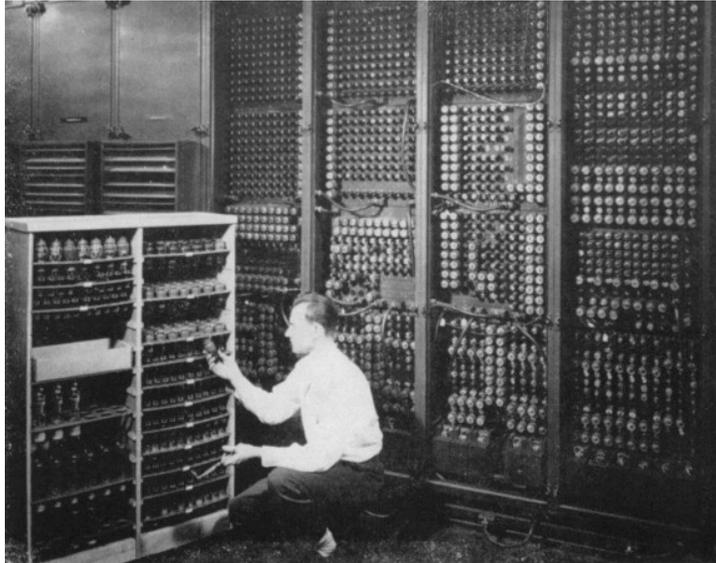


## Now for some history...



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

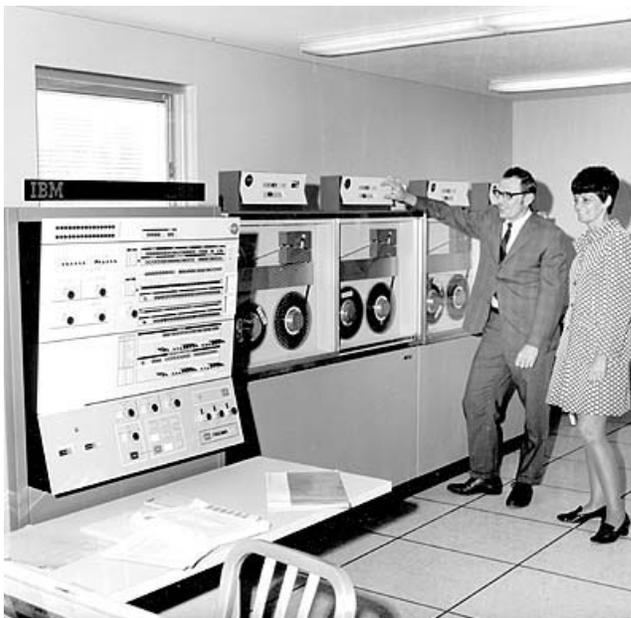
Vacuum tubes!



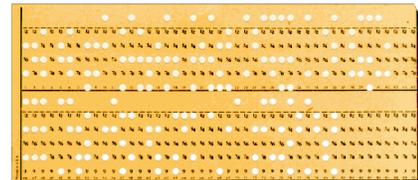
Replacing a bad tube meant checking among ENIAC's 19,000 possibilities.

# 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)



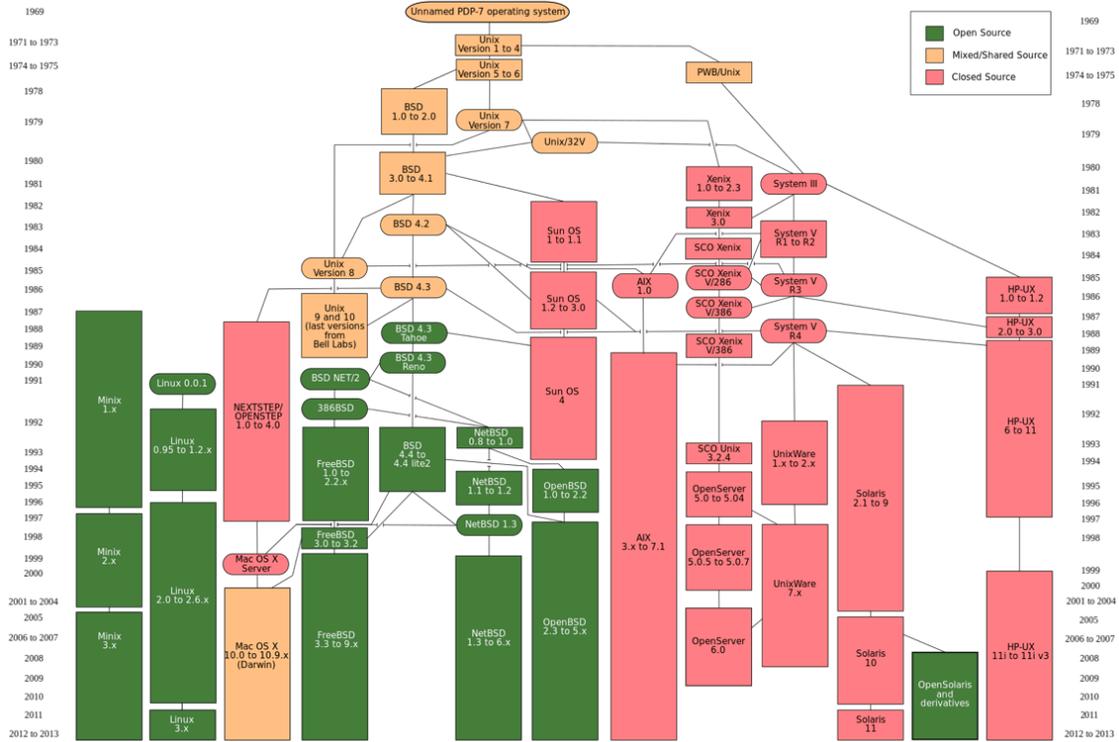
## 5. Mobile & Distributed (2000-present)



## 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.

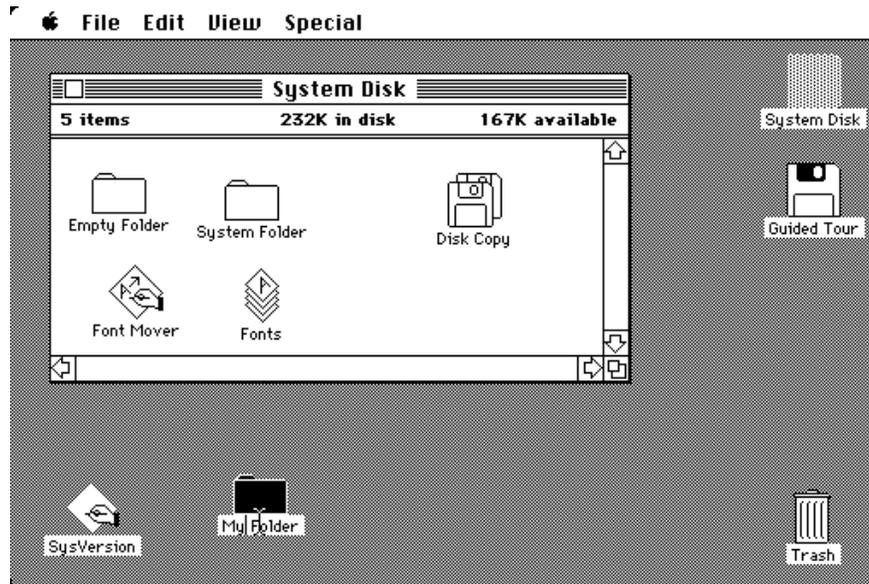
Incorrect password. Exiting function.
>SYS

Main Harddrive: Q:/
Space Used: 105246/6152374 KB
Processing Power: 10 GH
RAM: 3000000 KB
>OPEN GAMES

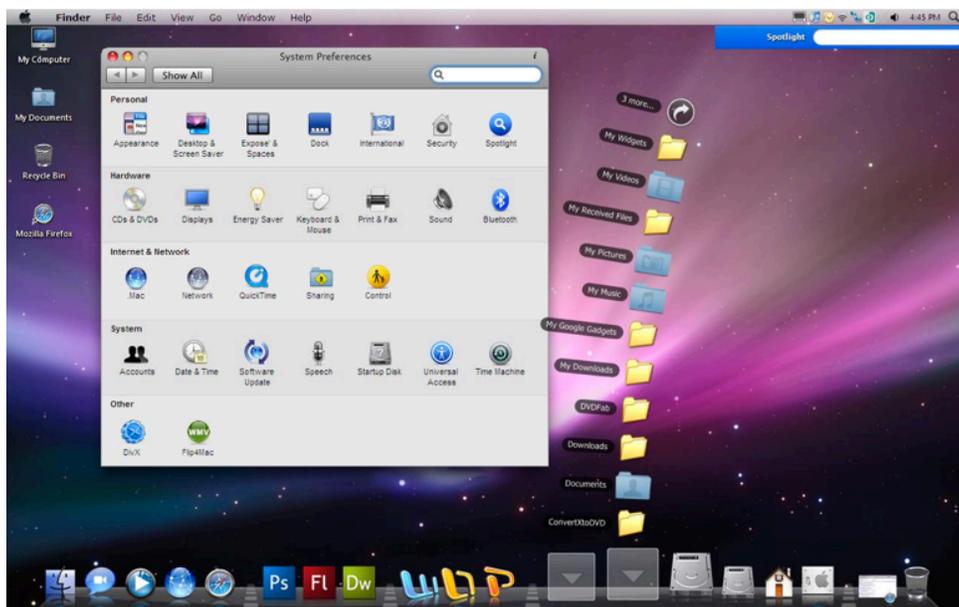
What are you, stupid? GAMES isn't a directory! Try Q:!/
>EXECUTE adventure.EXE

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

# Mac OS (1984)



# Mac OS X (2014)



# Where are we going?

