

# Introduction to Programming for Public Policy

## Lecture 1

Eric Potash

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# Overview

# Why learn programming?

# Do things better

- Automation
  - Automate downloading and merging and cleaning of data
- Speed
- Collaboration using git
- Clarity and reproducibility

# Do new things

- Data sources
  - web APIs, web scraping, databases, geographic data, etc.)
- Visualizations
- Models
  - “machine learning”

# Why now?

- Software is easier and more powerful than ever
- More data is publicly available than ever
  - e.g. municipal data portals
- More organizations are using these tools

# Syllabus

# Administrative

- Course website: <https://harris-ipp.github.io>
- TAs will host lab sessions:
  - TODO
- Canvas for discussion, etc.
- Link to slides



# Content

- Low level tools: command line
- Thinking algorithmically with python
- Fundamentals of databases and the web
- Putting it all together to execute a project

# Assignments

# Plagiarism policy

# Quizzes

# Final Projects

# Command Line

# What is the command line?

# How does a computer work?



# Hardware

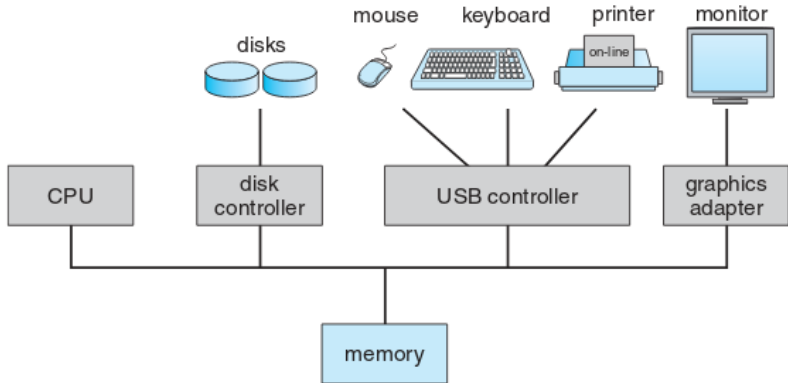


Figure 1: Computer hardware (Silberschatz et. al 2014)

# Software

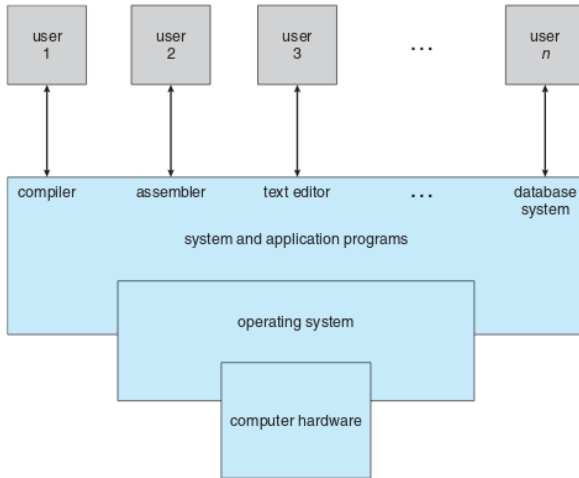


Figure 2: Computer hardware (Silberschatz et. al 2014)

# Operating System

- Does things that the user doesn't need or want to deal with
- Makes system more efficient and convenient
- Intermediary between user and hardware

# Unix

- In the 1970s AT&T Bell Labs developed an operating system called Unix
- The code was licensed to academic (Berkeley) and commercial (IBM, Sun) vendors who created Unix variants
- Today there are many Unix variants
  - Linux is an open-source Unix developed by Linus Torvalds in the 1980s
    - Google's Android is based on Linux
  - Mac OS X is also a Unix variant
  - Windows is *not* Unix, though the software Cygwin provides a "Unix-like" environment

# Command Line

- One of the essential features of Unix for users is its command line (or shell)
- This is a text interface for executing commands
- It hides the details of the underlying operating system
- The Unix shell has

# Bash

# Cygwin

# Commands



# Git