

CS344

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– put [CS344] in subject

Class web page:

– Available on Canvas

Who are you?

- Make an introduction on Canvas -> Discussions

CS344 Structure

- Please see the Syllabus for Grading, assignments, these videos, etc.
- More importantly, see the Syllabus for a listing of course objectives.

Tools versus Theory

- C++? Java? *nix? Apple?
- You're CS majors, not *nix majors!
- We'll stress the practical applications


Linux

- Why *nix?
 - Stable: good luck crashing it
 - Powerful: dense commands
 - Standard: used everywhere
- How we'll use Linux
 - Access via SSH:
 - `flip.engr.oregonstate.edu`
 - Server we're running things on:
 - `os-class.engr.oregonstate.edu`


What is an Operating System?

- A software program that sits between software applications and the computational hardware

Why are OSs Important?

- Most applications interact with the OS 
 - As a programmer, understanding the capabilities, policies, and limitations of the OS == more effective programmer

Goals of an Operating System

- Universal
 - Provide **convenient** software interface to **hardware resources**
 - Maximize **utilization** of hardware
 - Solve **contention**
 - Provide **services**
- Common
 - Provide security 
 - Protect against other buggy applications/crashes
 - Control access to your data by others
 - Support software development
 - Provide standardized software libraries
 - Including a standardized user interface

Definitions

- **Program**
 - A **stored** algorithm or plan of execution
- **Process**
 - A program that has been loaded **into memory** and **is executing**
- **Thread**
 - A **line of execution** in a process

Standard OS Services



That we're covering!

1. Process and thread management

- Starting a new program (becomes a process & thread)
- Ending a process/thread
- Debugging programs/processes

2. File and input/output management

- Organizing bits into meaningful structures: Files
- Providing interfaces for reading and writing to files
- Communicating with external devices
- Organizing files: Directories


Standard OS Services



That we're covering!

3. Interprocess communication (IPC)
 - Signals, pipes, network sockets (TCP/IP)
 - Including between two different computers
4. Process coordination
 - Contention management == Shared access

Interacting With the OS

- Users
 - Graphical User Interface (GUI)
 - Command Line Shell (|4><0|2\$)
- Programs 
 - Function-style
 - System calls
 - Application Programming Interface (API) - Functions
 - Network communication
 - Message-based
 - Connection-based

End