CSE 306
Operating Systems
Introduction
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Paperwork
- I am handing out a survey on your background as well as an intellectual honesty policy statement.
- Fill both out and return them before you leave
- More in a bit

What is an OS?
- All of the stuff between you/your application and the hardware
  - Kernel
  - Device Drivers
  - API libraries
  - UI
- Our focus is mostly on the kernel, with some attention to the others

Why Operating Systems?
- Primary Goal: Demystify how computers work
  - Lots of abstractions and heuristics between your application and the hardware
  - A good computer scientist should understand what happens inside the system when one types a command
- Secondary: Learn how to write robust programs
  - OSes like Linux have many users and work on a wide range of hardware
  - Deal with subtle issues: concurrency, consistency, etc.

Labs: Learn by doing
- This course is coding intensive
  - You should know C, or be prepared to remediate quickly
  - You will learn basic, inline x86 assembly
  - You must learn on your own/with lab partner
  - You will write substantial applications in C
  - Final project will involve substantial modifications to the Linux kernel
  - Challenging, but a very marketable skill

Lab Teams
- Lab 1: Everyone does this lab alone
- Lab 2 and 3: May work with a partner or alone
- Lab 4: May work in a team up to 4 students
Lab Teams
+ Can work alone, but better with help
+ No need to be a hero
+ Choose your own partners
+ Course mailing list good for finding them
+ Same for entire course
+ Changes only with instructor permission
+ For lab 4, you can only join with another team

Challenge Problems
+ Each lab may include challenge problems, which you may complete for bonus points (generally 5—10 points out of 100)
+ Unwise to turn in a lab late to do challenge problems
+ Can complete challenge problems at any point in the semester—even on old labs
+ Indicate any challenge problems completed in challenge.txt file

Required Readings
+ Primarily from the class textbook
+ Should be completed before the lecture
+ Required reading material may appear on the exams, even if not discussed in lecture
+ Several recommended texts will be posted
  + Several free on SBU safari online site
  + Papers you can print out or read electronically
  + Others on reserve at library

Lectures
+ Discuss and supplement reading material
+ An important chance to clarify issues
+ Questions are encouraged!
+ I expect you to arrive prepared to answer and ask questions about the reading material
+ Everything in lectures may appear on the exams, even if not in the book

Prerequisites
+ CSE 219 (CS III) or CSE 260 (CS B, Honors)
+ CSE 220 (Systems-level Programming) or ESE 380 (Embedded Microprocessor Design I)
+ The background courses are necessary
+ In some cases, industry experience is ok
  + In-class quiz, due before you leave
  + If you can’t answer 50% of these questions you are not prepared
+ C programming
+ Basic Unix command-line proficiency

C Programming
+ You should have learned C in the prerequisite courses
+ If you have not and want to take the course, you should read “The C Programming Language” by Kernighan and Ritchie cover to cover this week
+ And complete all exercises in the book
+ If you can do this, you will be prepared to complete this course on schedule
Course email list

- Sign up at http://lists.cs.stonybrook.edu/mailman/listinfo/cse306
- This is the primary announcement medium
- And for discussions about course work
  - Do not post code here or other solutions
  - Goal: Everyone can learn from general questions
  - Material discussed on the mailing list can be an exam question

Other administrative notes

- Read syllabus completely
- Subscribe to the class mailing list
- 2 exams cover: lectures, labs, mailing list
- Every student will get a VM for lab work
  - You may use your own computer, staff can't support it
  - All staff email goes to cse306ta@cs.stonybrook.edu
    - Except private issues for instructor only

Special Offer!

- You can write your own exam questions
  - Send them to me in advance of the test, if I like them, I will use them
  - Do NOT share with anyone else

VM Assignments

- Your VM is cse306-USER, where USER is your netid
- Each VM is hosted on the server esx1sc--esx4sc
  - You should receive an email with your server and initial password
  - The account is csec06
- Once it is powered on, it will listen for ssh on port 130
  - Change the password immediately

Academic Integrity

- I take cheating very seriously. It can end your career.
- In a gray area, it is your job to stay on right side of line
- Never show your code to anyone except your partner and course staff
- Never look at anyone else's code (incl. other universities)
- Do not discuss code; do not debug each other's code
- Acknowledge students that give you good ideas

Why do we care?

- Analogy: This is the programming dojo
  - If you don't do your exercises, you will be unprepared for battle
  - You've wasted your money and both of our time
  - It brings dishonor on the dojo when you lose every battle
- Similarly, a lot of what I have to teach (and what will make you a valuable employee when you graduate) has no short cut
  - How do you learn to punch through a board?
  - You punch a board over and over until your fist goes through it
Productive Frustration

- One of the "meta skills" that distinguishes an excellent programmer is the ability to get un-stuck
- Fixing a "heisenbug" has this property
- How do you learn this skill?
- Get stuck on a hard, but solvable problem
- Learn which strategies will get you moving again
- If you take a quick cheat, you won’t learn the skills to solve truly hard problems

Integrity Handout

- Each of you must initial each bullet on the integrity handout and sign at the bottom
- I need a record that you have read and understood the policies of this course
- I will not grade your assignments or assign a final grade until I have received this from you
- I will check this

Lateness

- Each student gets 72 late hours
- List how many you use in slack.txt
- Each day after these are gone costs a full letter grade on the assignment
- If you work in a team, each member loses 1 hour for each hour late
- It is your responsibility to use these to manage:
  - Holidays, weddings, research deadlines, conference travel, Buffy marathons, release of the next Zelda game, etc.
  - 3 Exceptions: illness (need doctor’s note), death in immediate family, accommodation for disability

Lab 1 assigned

- Due Friday, 2/15 at 11:59 pm, eastern.
- Instructions on website
- Start early!

Getting help

- TA’s will keep office hours (TBD)
- Sourabh and Nipun
- Very knowledgeable and friendly grad students
- Instructor keeps office hours
- Note that “by appointment” means more time available on demand

Questions?

- Remember:
  - Hand-in survey and honesty policy
  - Assignment 1 out (work alone)
  - Reading assigned for Thursday