Introduction

COMP3231/9201/3891/9283

(Extended) Operating Systems

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Welcome to OS @ UNSW

Course Outline

Prerequisites

- COMPXXXX Data structures and algorithms
  - Stacks, queues, hash tables, lists, trees, heaps,….
- COMPXXXX Microprocessor and Interfacing or Computer Systems Fundamentals
  - Assembly programming
  - Mapping of high-level procedural language to assembly language
  - Interrupts
- We will be using the C programming language
  - The dominant language for OS (and embedded systems) implementation.
  - Need to understand pointers, pointer arithmetic, explicit memory allocation.

Why does this fail?

```
void set(int *x, int *y)
{
   *x = 1; *y = 2;
}
void thingy()
{
   int *a, *b;
   set(a,b);
   printf("%d %d\n",*a,*b);
}
```

Why does this fail?

```
void set(int *x, int *y)
{
   *x = 1; *y = 2;
}
void thingy()
{
   int a, b;
   set(&a,&b);
   printf("%d %d\n",a,b);
}
```

Lectures

Common for all courses (3231/3891/9201/9283)

- The lecture notes will be available on the course web site
  - Available prior to lectures, when possible.
  - Slide numbers for note taking, when not.
- The lecture notes and textbook are NOT a substitute for attending lectures.
  - Video might be…..
- Will attempt to have "video" available, baring technical hitches.
  - Echo360 is a backup

Extended OS Comp3891/9283

Starts in week 2

A combination of:
- Examination of topics in more depth
- Looking at research in area (past/present)
- OS/161 internals in more depth

Separate Assessment
- 75%-ish of final exam common with base course
- 25%-ish targeted to extended students
- Parts of advanced assignments part of assessment

Assumes the tutorials are not challenging enough
- Effectively replaces the tutorial with extra interactive lecture.

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Tutorials

Start in week 2

No participation marks again this year.

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Assignments

Assignments form a substantial component of your assessment.

They are challenging!!!!
- Because operating systems are challenging

We will be using OS/161,
- an educational operating system
- developed by the Systems Group At Harvard
- It contains roughly 20,000 lines of code and comments

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Assignments

Don't under estimate the time needed to do the assignments.
- 80% is understanding
- 20% programming

If you start a couple days before they are due, you will be late.
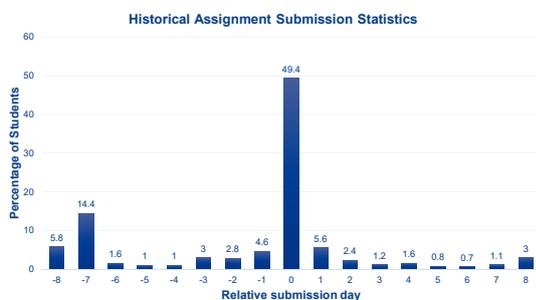
To encourage you to start early,
- Bonus 10% of awarded mark of the assignment for finishing a week early
- See course handout for exact details
  – Read the fine print!!!!

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Assignments   16% late

Historical Assignment Submission Statistics

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Assignments

Late penalty
- 4% of total assignment value per day
  – Assignment is worth 20%
  – You get 18, and are 2 days late
  – Final mark = 18 – (20*0.04*2) = 16 (16.4)

Assignments are only accepted up to one week late. >7 days = 0

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Assignments

Warmup exercise (ASST0)
- Bonus marks
- Done individually
- Available ASAP!!!!

Assignments are in pairs
- Info on how to pair up available soon

Additional, advanced versions of the assignment 2 & 3
- Available bonus marks are small compared to amount of effort required.
- Student should do it for the challenge, not the marks.
- Attempting the advanced component is not a valid excuse for failure to complete the normal component of the assignment

Part of the advanced assignments are part of Extended OS student's (COMP3891/9283) assessment
- Not optional.

Assignments

Three assignments
- due roughly week 6, 9, 13

Also warm up bonus exercise due in week 4
- It's a warm up to have you familiarize yourself with the environment and easy marks.
  - Set up revision control
  - Practice submitting a patch
  - Practice using code browser/editor
- Do not use it as a gauge for judging the difficulty of the following assignments.

Assignments

```
Submission test failed. Continue with submission (y/n)? y
```
Lazy/careless submitter penalty: 15%

Submitted the wrong assignment version penalty: 15%
- Assuming we can validly date the intended version

Assignments

To help you with the assignments
- We dedicate a tutorial per-assignment to discuss issues related to the assignment
- Prepare for them!!!!!

Plagiarism

We take cheating seriously!!!

We systematically check for plagiarised code
- Penalties are generally sufficient to make it difficult to pass

We can google as easy as you can
- Some solutions are wrong
- Some are greater scope than required at UNSW
  - You do more than required
  - Makes your assignment stick out as a potential plagiarism case

Plagiarism

Avoid public github repositories!!
- Obtain a free academic account.

Note: bitbucket.org has free academic accounts
- Unlimited private repositories.

We also provide group accounts to host source code at CSE.

Exams

There is NO mid-session

The final written exam is 2 hours

Supplementary exam are available according to UNSW & school policy, not as a second chance.

- Medical or other special consideration only

3231/9201 Assessment*

Exam Mark Component	Class Mark Component
• Max mark of 100	• Max mark of 100
Based solely on the final exam	100% Assignments
	• Out of 90 marks that are scaled to 100

* Course outline is authoritative.

3891/9283*

10% class awarded based on advanced assignment attempts

- Not optional

Classmark = 10% advanced + 90% assignments

* Course outline is authoritative.

Assessment

The final assessment is a weighted harmonic mean of 60% exam (E) and 40% class (C) component.

$$M = \frac{5EC}{2E + 3C}$$

Assessment

You need to perform reasonably consistently in both exam and class components.

Harmonic mean only has significant effect with significant variation.

Reserve the right to moderate marks, and moderate courses individually if required.

- Warning: We have not moderated marks in the past.

Textbook

Andrew Tanenbaum, *Modern Operating Systems,* 3rd/4th Edition, Prentice Hall

References

A. Silberschatz and P.B. Galvin, *Operating System Concepts*, 5th, 6th, or 7th edition, Addison Wesley

William Stallings, *Operating Systems: Internals and Design Principles,* 4th or 5th edition, Prentice Hall.

A. Tannenbaum, A. Woodhull, *Operating Systems--Design and Implementation*, 2nd edition Prentice Hall

John O'Gorman, *Operating Systems*, MacMillan, 2000

Uresh Vahalla, *UNIX Internals: The New Frontiers*, Prentice Hall, 1996

McKusick et al., *The Design and Implementation of the 4.4 BSD Operating System*, Addison Wesley, 1996

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Piazza Forums

Forum for Q/A about assignments and course
- Ask questions there for the benefit of everybody
- Share your knowledge for the benefit of your peers
- Look there before asking
- Apps for phone

https://piazza.com/
- Longer link on class web page
  - You will have received an invite from them to your UNSW email address.
  - Please join and contribute.

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Consultations/Questions

Questions should be directed to the forum.

Admin and Personal queries can be directed to the class account cs3231@cse.unsw.edu.au

We reserve the right to ignore email sent directly to us (including tutors) if it should have been directed to the forum.

Consultation Times
- See course web site.
- Must email (cs3231@cse) at least an hour in advance and show up on time.

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Course Outline

"the course aims to educate students in the basic concepts and components of operating systems, the relevant characteristics of hardware, and the tradeoffs between conflicting objectives faced by operating systems in efficiently supporting a wide range of applications."

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The End

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