CS2014
Systems Programming

Lectures:

Stephen Farrell

stephen.farrell@cs.tcd.ie, x2354
Room: WR3.4 (impossible to find!)

Teaching Assistant:

Christian Cabrera

cabrerac@scss.tcd.ie
See Christian @ labs

CS2014
Systems Programming

Teaching Assistant:
Christian Cabrera
cabrerac@scss.tcd.ie
See Christian @ labs

Demonstrators:
Jose Monreal <monrealj@tcd.ie>
Fadhil Firyaguna <firyaguf@tcd.ie>

My Favourite LOC

```
#define malloc(__xxx__) \
   (rand()%100<=30?0:malloc((__xxx__)))
```

Administrivia (1)

- Lectures:
  - Tuesday, 1500-1550, LB01
  - Wednesday, 1300-1350, LB08
- Labs:
  - Thursday, 1200-1600, LG12
  - Labs are for you to do/get-help-with assignments (more on those in a second)
    - It is also just fine to work on the assignment on your own computing devices
  - There are more of you than there are seats in the lab, so...

Administrivia (2)

- Lab slots:
  - Group 1: 12.00-12.50: Students whose surname begins with a letter between "P" and "Z".
  - Group 2: 13.00-13.50: Students whose surname begins with a letter between "K" and "O"
  - Group 3: 14.00-14.50: Students whose surname begins with a letter between "D" and "J"
  - Group 4: 15.00-15.50: Students whose surname has a prefix between "A" and "C"

Administrivia (3)

- 2017 timing:
  - Lecture#1: September 26th
  - Week of November 13th: no lectures!!
    - TBD: Or maybe Christian takes those slots!!
  - Last lecture: December 13th
  - Last lab: December 14th
  - Last assignment due: Dec 15th
  - Exams: later (April/May)

Administrivia (4)

- Exam/Assignments: 80/20
  - That is: assignments are worth 20%
  - You MUST pass both independently

```
int bummer=0; int pass;
if (exam_mark < 0.4) {bummer=1;}
if (assignment_mark < 0.4) {bummer=1;}
if (!bummer) pass=1; else pass=0;
```

- There will be 6 marked assignments, each with a deadline

Administrivia (5)

Assignments to be submitted at:

https://cs2014.scss.tcd.ie

You'll get an email with sign-up instructions

Don't use a valuable password!!!

– Don't use a crap password either

There's a dummy "Hello, world!" assignment (as0) you can do this week for practice

More on that next week

Administrivia (6, and the last!)

- Assignment deadlines:
  - Assignment1: deadline 2017-10-09
  - Assignment2: deadline 2017-10-16
  - Assignment3: deadline 2017-10-23
  - Assignment4: deadline 2017-11-13
  - Assignment5: deadline 2017-12-04
  - Assignment6: deadline 2017-12-15

Systems Programming: what's that?

- As always, it depends who you ask:-)

    – https://duckduckgo.com/html?q=systems%20programming

- Wikipedia definition#1 is most like this course, saying systems programming is lower level than application programming and can make assumptions about the system on which the code is run.

    – Often related to how the OS/system interacts with higher level code/users.

- DevOps trend though maybe changes this some: A lot of "systems programming" in future may involved python, Rust, Go, PHP/Node.js and JS etc as the boundaries between applications and systems blur.

- For now though, we'll stick with what Wikipedia says (today:-), on the basis that if you learn a couple of pogramming languages, the rest are mostly the same and you can learn them yourself later as needed (and fashions will change before you do that, probably;-)

Course Content

- Introduction

- A bit about using GNU/Linux

- Various bits of C programming

- Safety with dangerous implements

- A touch of C++ programming

- Something interesting for the end, that I've yet to decide upon

- And 6 programming assignments

What's our goal here?

- You'll learn C/C++ and a bit about the systems we use for doing assigments

- Higher level goal is that you can figure this stuff out for yourself when you later come across similar problems/challenges/opportunities:

  - On different systems

  - With different languages

  - Using different libraries

  - With or without handholding IDEs

- It is entirely fine that you have to look stuff up when you forget details, especially wrt APIs and libraries (I do that all the time)

  - Web search -> stackexchange etc. is almost entirely a fine thing

  - As always though, don't believe all you read

What's our goal here?

- There are also even higher level goals...

- Being able to (figure out HOWTO) program gives you more potential to be an independent entity in this century's information-driven environment

  - It also gives you opportunities to help others, e.g. via OSS

  - This is not intended to (only:-) make you a more efficient corporate droid

- I claim: Widespread availability of flexible programming skills is a pre-requisite for defending freedom of expression and other human rights

  - See: universal declaration of human rights, esp. article 19. https://undocs.org/A/RES/217(III)

  - Meeting minutes:-) https://undocs.org/A/PV.183

My Favourite LOC

```
#define malloc(__xxx__) \
   (rand()%100<=30?0:malloc((__xxx__)))
```

- Let's shift from slideware to HTML:

https://down.dsg.cs.tcd.ie/cs2014/examples/bm/README.html