The IA Computer Science Registration Lecture

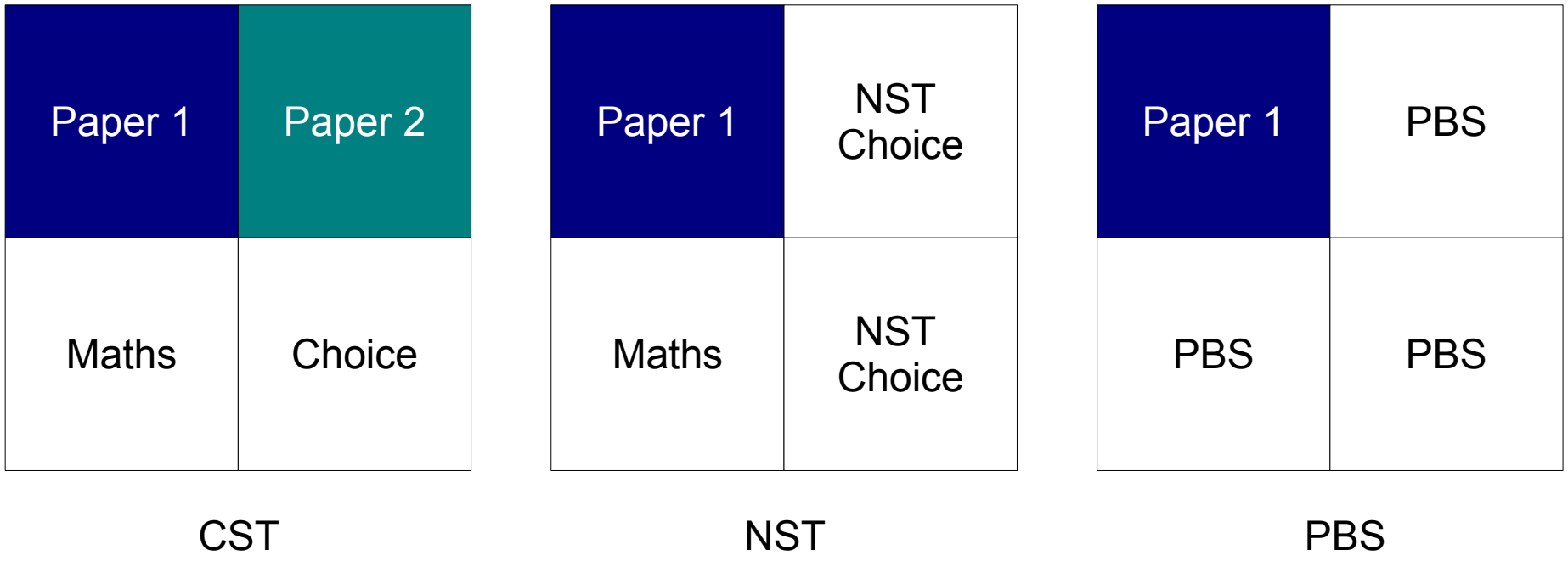
for

All Computer Scientists
NST students taking the CS option
PBS Students taking the CS option

Course Outline and Lectures

Course Structure

- There are **two** IA CompSci examination papers at the end of the year:
  - Paper 1 – taken by everyone here
  - Paper 2 – **Only** for CST and **not** NST/PBS



Paper Topics

Paper 1

Foundations of CS

Object Oriented Programming

Algorithms

Numerical Methods

Paper 2

Digital Electronics

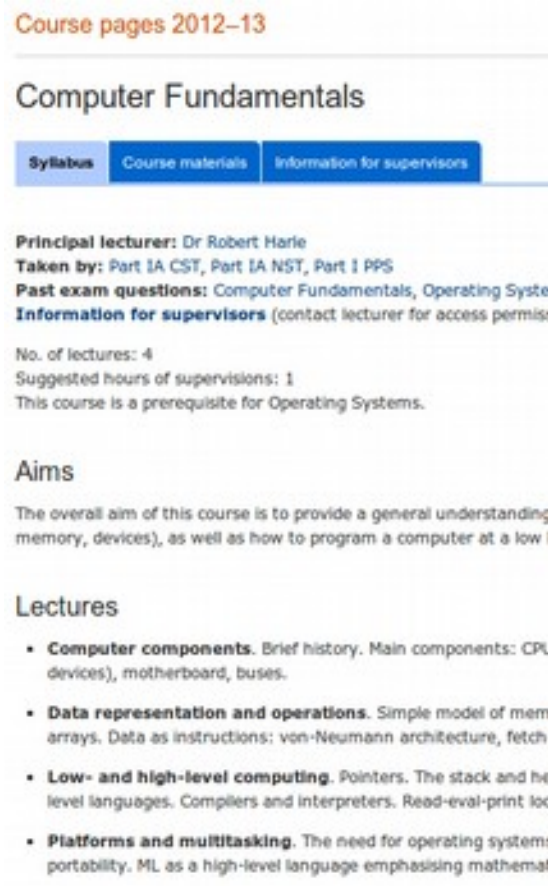
Discrete Maths

Operating Systems

Software and Interface Design

Lecture Course Information

- We do **not** use moodle for lecture material. Instead you will find everything on our website, www.cl.cam.ac.uk/teaching
  - Syllabus
  - Books
  - Lecturer contact details
  - Electronic copies of notes
  - Electronic copies of examples sheets
  - Errata
  - Additional material from the lecturer


Course pages 2012–13

Computer Fundamentals

Syllabus | Course materials | Information for supervisors

Principal lecturer: Dr Robert Harle
Taken by: Part IA CST, Part IA NST, Part I PPS
Past exam questions: Computer Fundamentals, Operating Syste
Information for supervisors (contact lecturer for access permis

No. of lectures: 4
Suggested hours of supervisions: 1
This course is a prerequisite for Operating Systems.

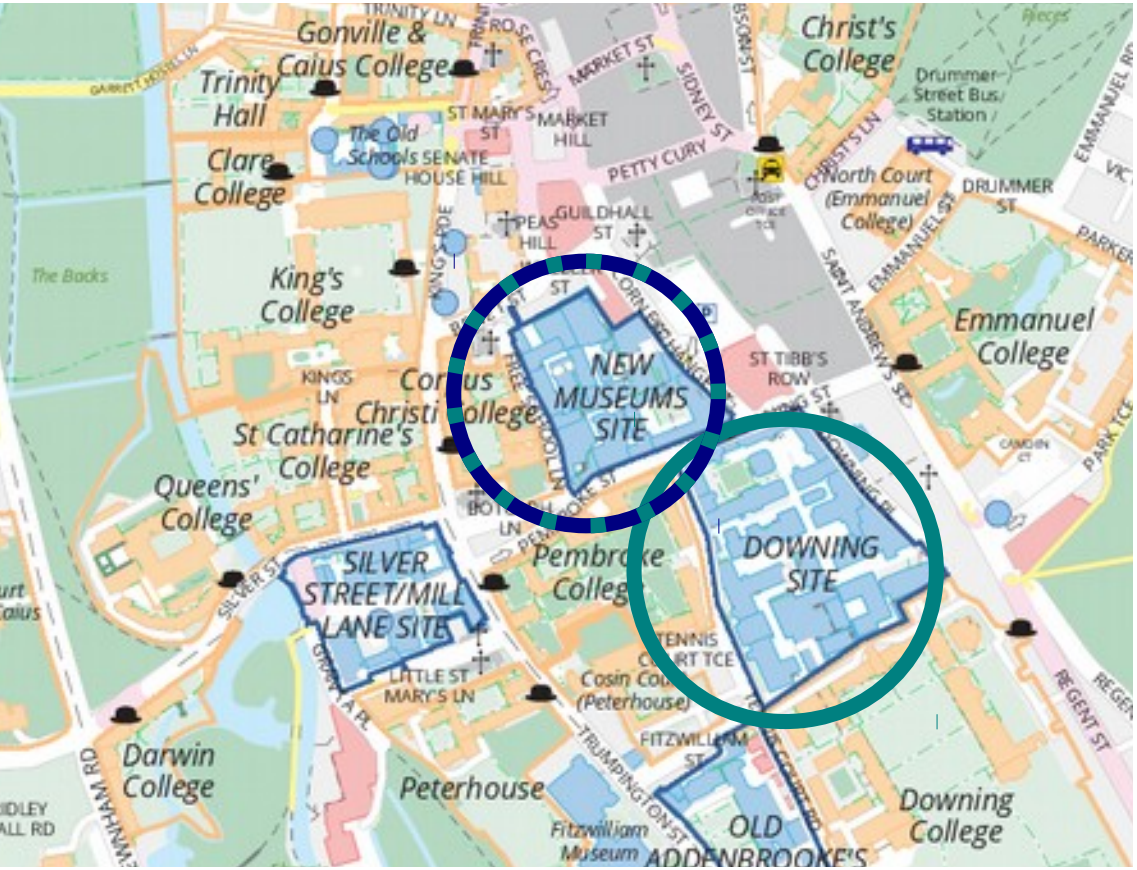
Aims

The overall aim of this course is to provide a general understandin
memory, devices), as well as how to program a computer at a low

Lectures

- **Computer components**. Brief history. Main components: CP
devices), motherboard, buses.
- **Data representation and operations**. Simple model of mem
arrays. Data as instructions: von-Neumann architecture, fetch
- **Low- and high-level computing**. Pointers. The stack and he
level languages. Compilers and interpreters. Read-eval-print lo
- **Platforms and multitasking**. The need for operating system
portability. ML as a high-level language emphasising mathema

Lectures



Paper 1 (All)

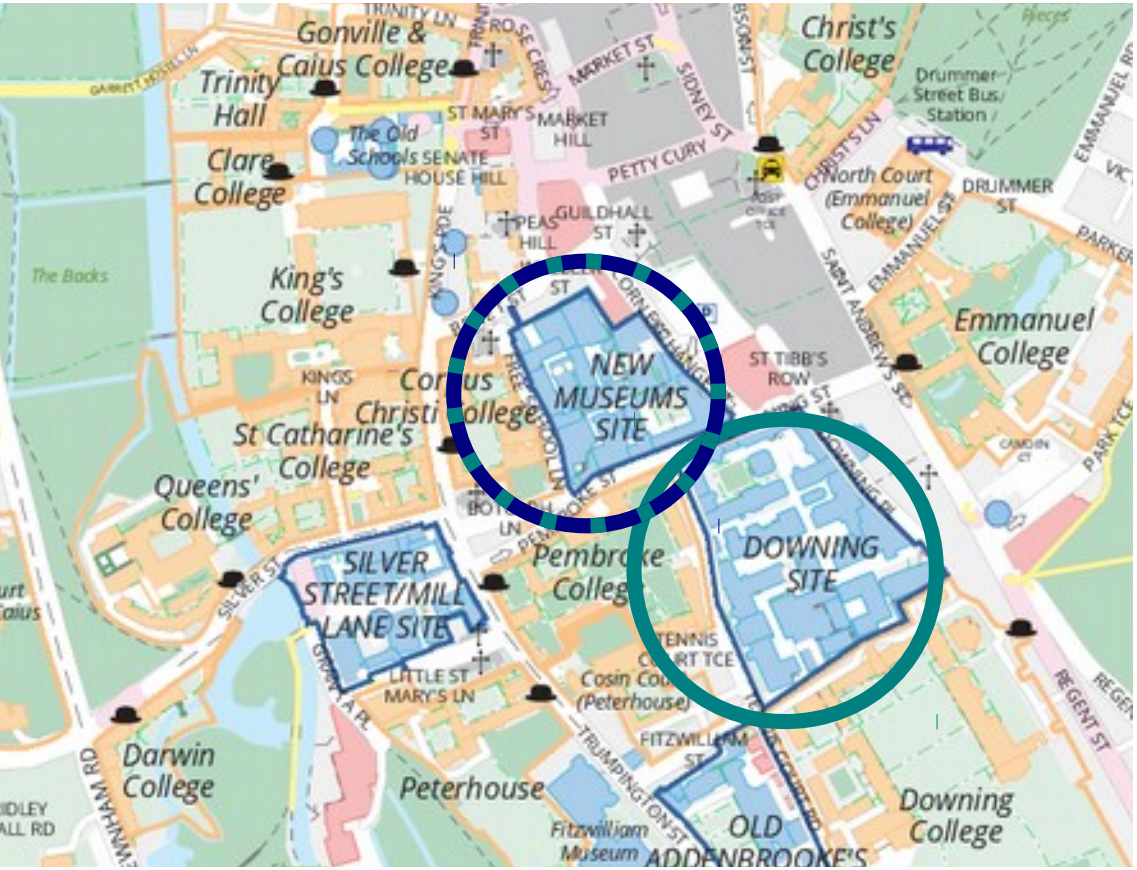
- **MWF 10-11**
- **Arts School Room A, New Museums Site**

Paper 2 (CST)

- **MWF 12-1**
- **Arts School Room A (Mon) New Museums Site**

  Biffen Lecture Theatre (Wed/Fri) Downing Site

Lectures



Paper 1 (All)

- **MWF 10-11**
- **Arts School Room A, New Museums Site**

Paper 2 (CST)

- **MWF 12-1**
- **Arts School Room A (Mon) New Museums Site**

  Biffen Lecture Theatre (Wed/Fri) Downing Site

NOTE: The original timetable email you received has the Paper 2 lecture rooms wrong: this slide is correct!

Recordings

- With modern phones it is tempting to start recording lectures for later perusal. But:

Recordings are forbidden
Unless you have explicit permission from the department and lecturer

- Applies to video AND audio
- Even with permission, you must only use it for private work and destroy it asap without sharing.

Optional Fundamentals Lectures

If you don't have any CompSci experience there are **OPTIONAL Computer Fundamentals** lectures on **Thursdays** that cover some basics.

Look out for emails with more details

Aside: Scientific Computing Course

- As part of the NST Maths course, there is a “Scientific Computing” course with three assessed exercises that count toward the maths option mark
- The content is *not* arranged or given by this department
- Information should have been provided in your NST practical allocation email yesterday

Aside: Scientific Computing Course

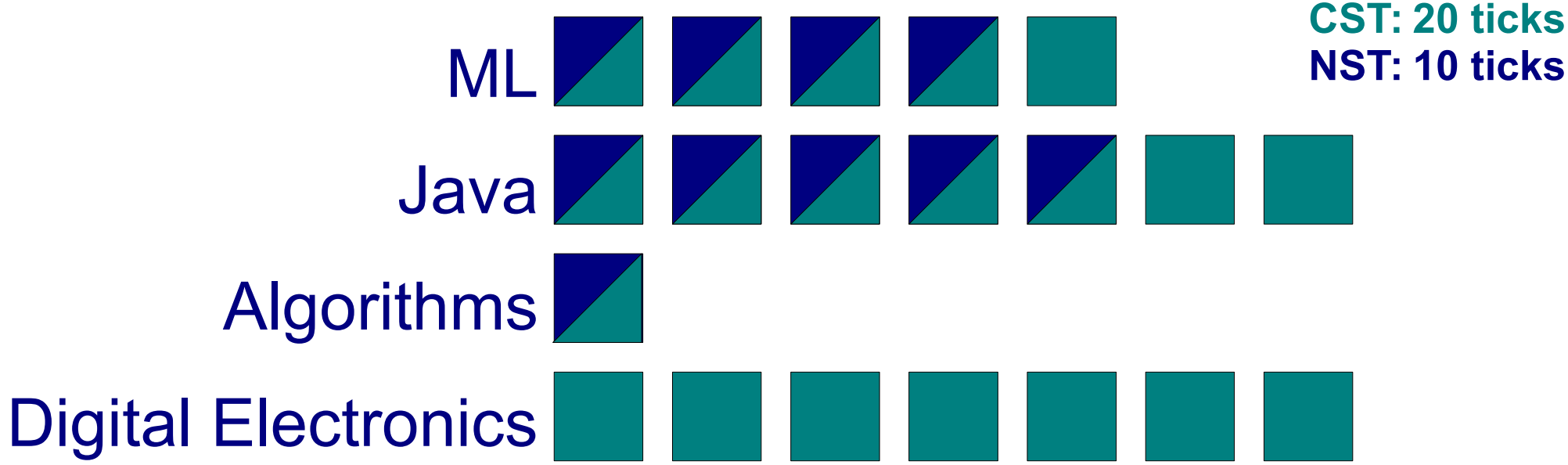
- As part of the NST Maths course, there is a “Scientific Computing” course with three assessed exercises that count toward the maths option mark
- The content is *not* arranged or given by this department
- Information should have been provided in your NST practical allocation email yesterday

If you do NST Maths you need to do the Scientific Computing course regardless of any CS option

Practicals (“Ticks”)

Practicals (“Ticks”)

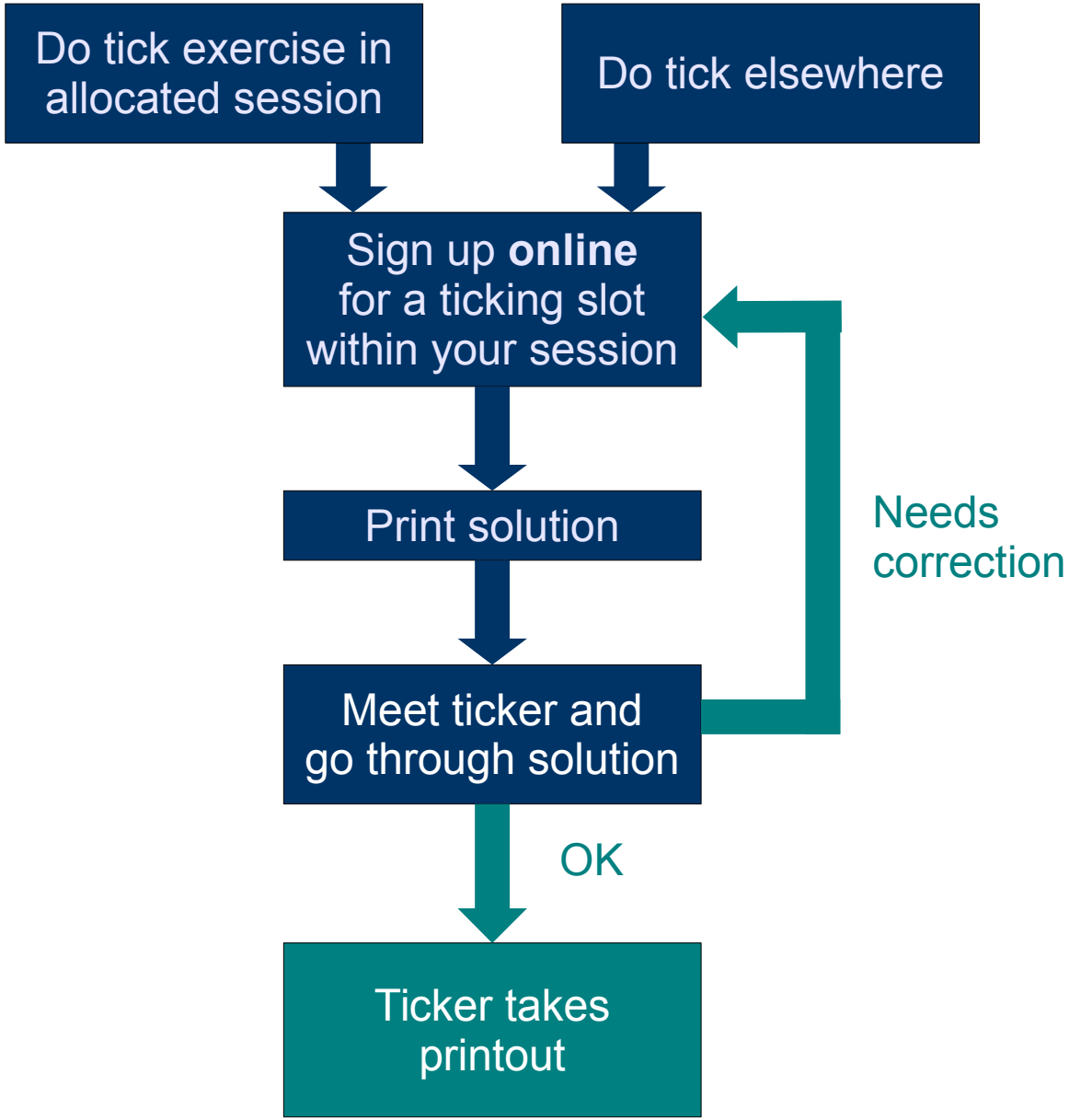
Practicals are called ticks
Held on Thursdays
Upstairs in the Intel Laboratory



Just so we're Clear...

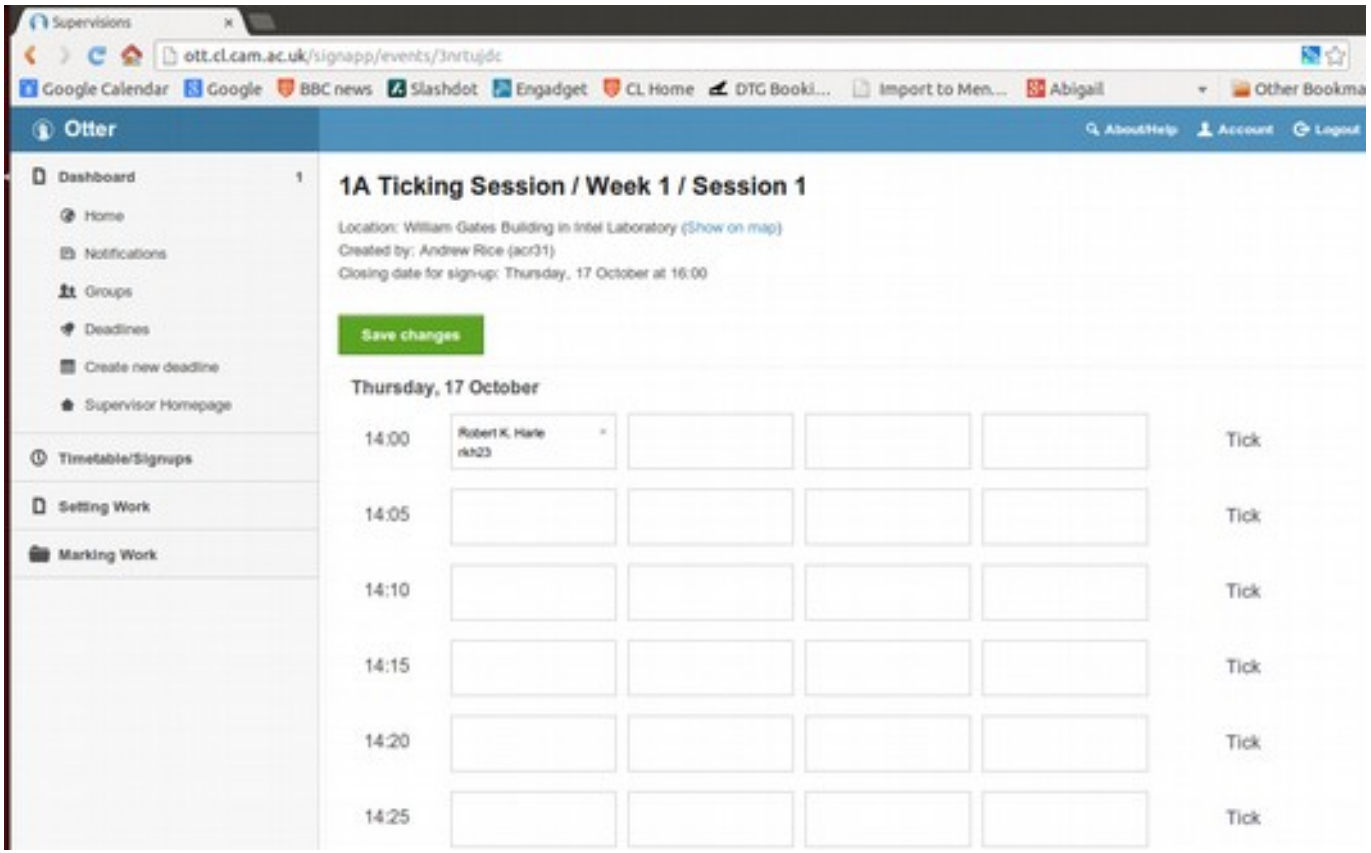
- Cambridge 'weeks' start on a Thursday
- So this is the start of week 1
- Your first practical is next Thursday, at the start of week 2 (more on this later)
- *No, I don't know why either.*

Ticking Process



The Tick Signup for ML/Java

- Online system for ticking slots
- First come, first served
- Sign up in advance or on the day



Signup Etiquette

- One slot per tick
- Don't sign up until you've completed the work!
- Don't take up multiple slots in advance. If you want to get multiple ticks one week, please sign up on the day
- Tickers try to keep to time but please be patient

Timings for ML/Java in Paper 1

- There is a nominal tick per week (tick one starts next Thursday, which is week 2)
- You must each tick within two weeks of the associated date
  - Tick 1 by end of week 4 session
  - Tick 2 by end of week 5 session
  - Tick 3 by end of week 6 session
  - Tick 4 by end of week 7 session
  - Etc.

Working Elsewhere

- You can do the work for your practicals anywhere
- Doing them here ensures you have access to demonstrators
- You still need to come here in person to get your ticks signed off each week

Working Elsewhere

- You can do the work for your practicals anywhere
- Doing them here ensures you have access to demonstrators
- You still need to come here in person to get your ticks signed off each week

This year there are so many of you that we don't have quite enough workstations upstairs!

→ Working at home helps ←

or

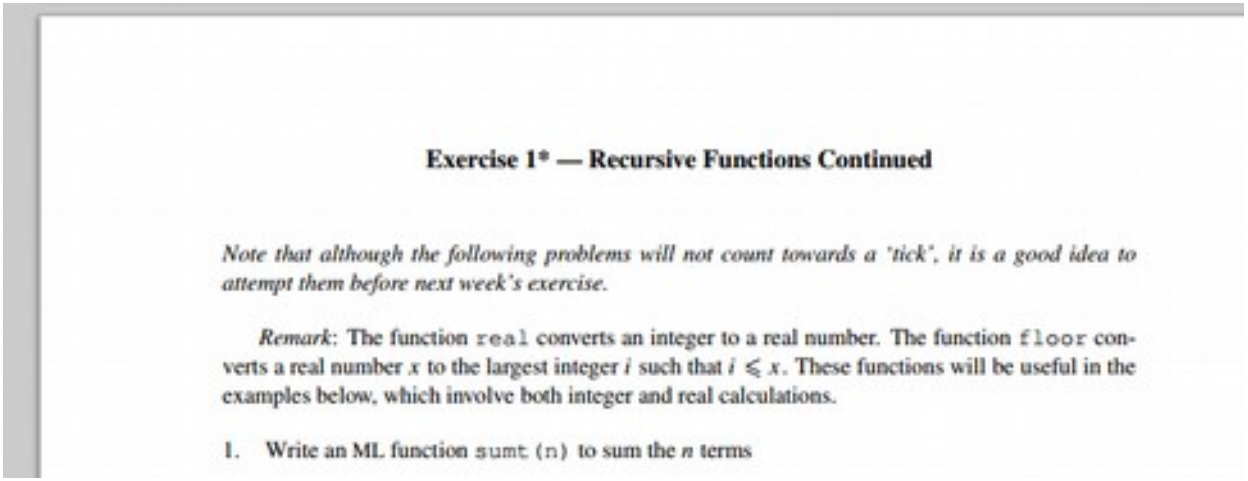
→ Bringing your own laptop helps ←

Running Ahead

- Practicals often align roughly to lectures
- But we give you all the ticks at once so you can race ahead if you like
- Beware: you might not learn as much this way. Ticks can be solved in different ways and you might miss the clever subtleties...

Starred Ticks

- Some of the ticks have an extension called a 'star' to challenge you if you find the core tick easy
- These do **NOT** count towards anything exam-wise and are strictly **OPTIONAL**
- But you get kudos for doing them so if you find the core tick easy, why not..?



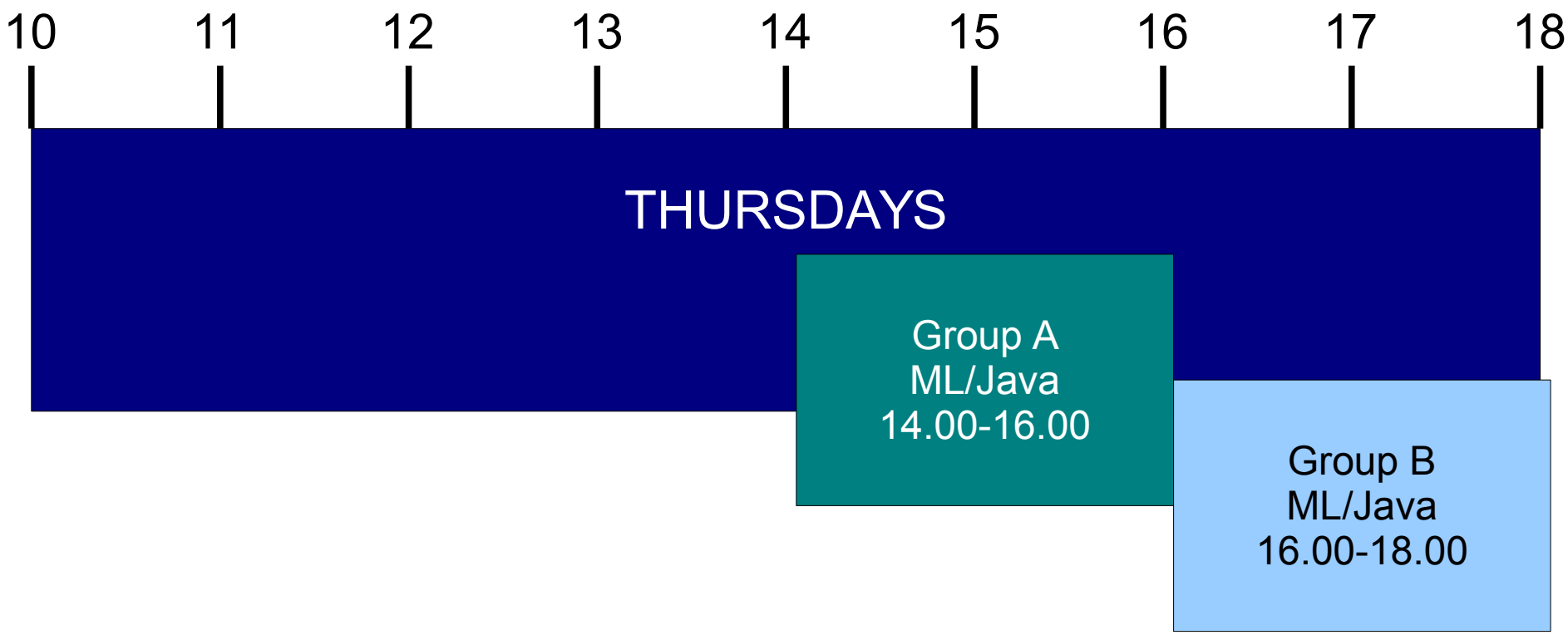
Exercise 1* — Recursive Functions Continued

Note that although the following problems will not count towards a 'tick', it is a good idea to attempt them before next week's exercise.

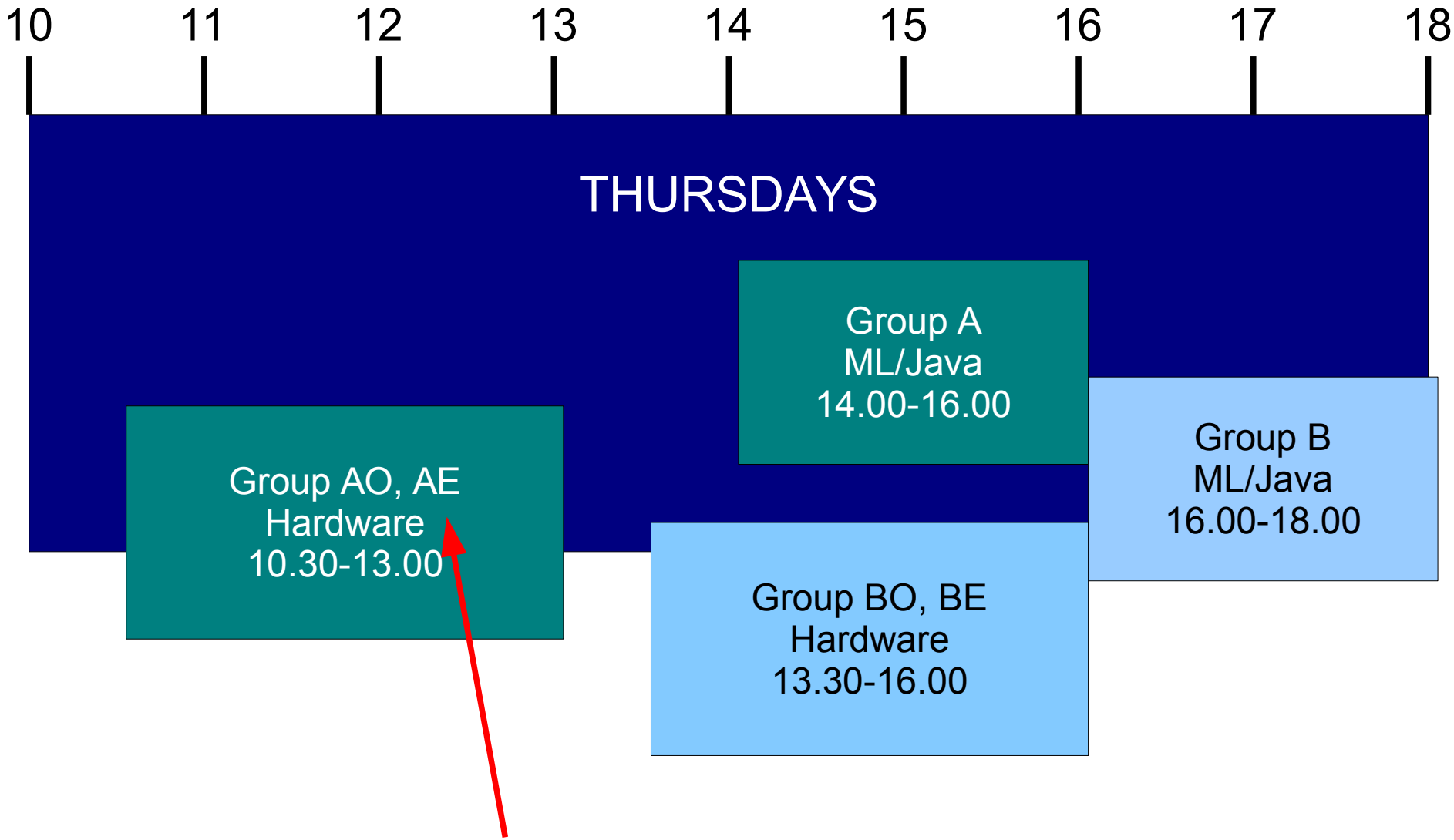
Remark: The function `real` converts an integer to a real number. The function `floor` converts a real number x to the largest integer i such that $i \leqslant x$. These functions will be useful in the examples below, which involve both integer and real calculations.

1. Write an ML function `sumt (n)` to sum the n terms

Practical Allocations (NST)



Practical Allocations (CST)



AO = Group A, Odd numbered weeks only
AE = Group A, Even numbered weeks only

Practical Allocations

- The group assignments are now available at http://www.cl.cam.ac.uk/teaching/1415/Registratn/
- That link will also be emailed to you
- Space is tight. If you want to swap you need to find someone to swap with and email **rkh23@cam.ac.uk** for permission

Some Study Tips for CS

Starting out in CompSci...

A Physicist, Engineer and Computer Scientist are travelling in a car when it breaks down.

Physicist: *We must have exceeded the elasticity of some component. We must get to a garage.*

Engineer: *No! Something will have fallen out of alignment. Let me hammer the engine a bit.*

Computer Scientist: *Hmmm. First let's turn the engine off, close all windows, and restart.*

Repetition is Everywhere

- There are a lot of connections in your various CS courses
- You probably won't see them at first, esp. if you're new to the subject
- But when you come to revise, things often slot into place and you realise we present the same ideas many times in different ways
- So what may seem complex and impenetrable at first often ends up being obvious and easy (ish)

Programming is a skill

- Skills need practice
- It is a good idea to install the necessary software on your own machines and play around with programming in addition to the coursework
- We have guidelines on setting up various programming environments online

Lectures should be Active not Passive!

- We give you lecture notes and some of you will take this as a cue to just kick back and listen in lectures

Lectures should be Active not Passive!

- We give you lecture notes and some of you will take this as a cue to just kick back and listen in lectures

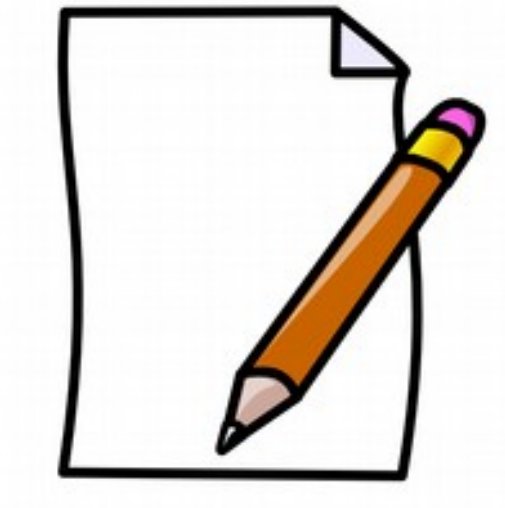
5% chance of info retention

Longman, D. and Atkinson, R. College Learning and Study Skills. 1999. Wadsworth/Thomson Learning

Lectures should be Active not Passive!

- We give you lecture notes and some of you will take this as a cue to just kick back and listen in lectures

5% chance of info retention



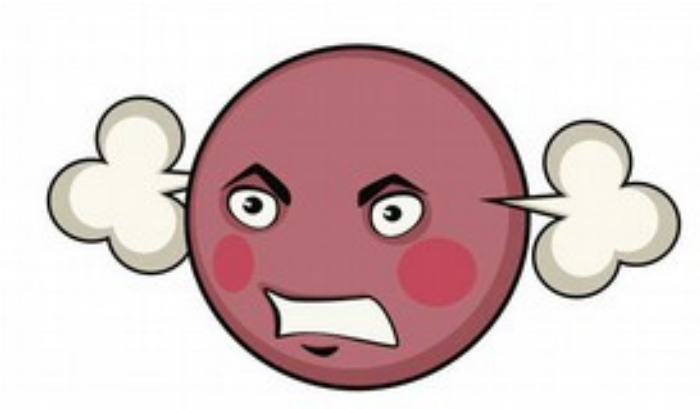
34% chance of info retention!

Longman, D. and Atkinson, R. College Learning and Study Skills. 1999. Wadsworth/Thomson Learning

Giving us Feedback

Feedback 1: SSCOF

- Staff-Student Consultative Forum
  - Allows you to give feedback to the department on anything from ticks to room temperature.
  - You elect a CST and an NST/PBS representative to this committee. They will periodically ask for your input.

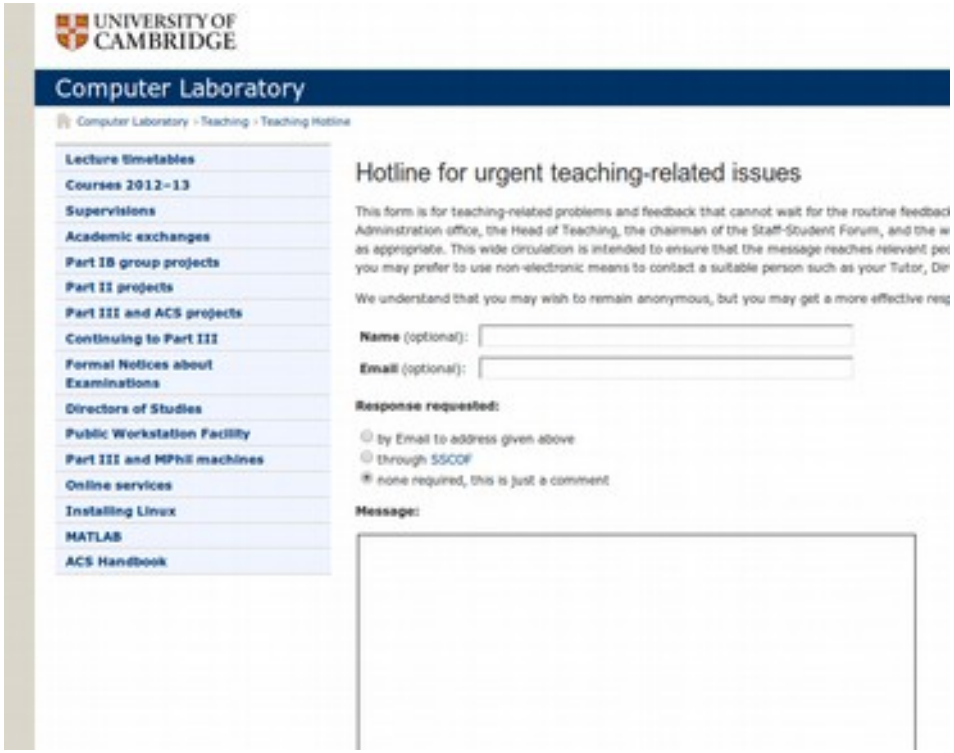


Feedback 2: Course Feedback

- We use electronic questionnaires after each course to gather specific feedback and improve
  - Please take the time to fill them out – we need statistically significant data!
  - The results are viewed by the Tripos Management Committee, the lecturer and (if they are fit to release) you!

Feedback 3: Urgent Feedback

- Sometimes there's something that needs fixing ASAP and can't wait for the feedback forms or SSCOF
- **http://www.cl.cam.ac.uk/teaching/hotline.html**
- This gives you an (**anonymous**) urgent feedback form that is sent immediately to the important people who can help



Professional Bodies

- Computer Science in the UK has two main professional bodies: the IET and the BCS
- Both have accredited our course so you are all eligible to join them. More details on the registration pages

- Can get chartered status
- Student: £32 for one year
- £52 for up to four years
- **www.bcs.org/student**

- Can get chartered status
- Student: £20 for one year
- £50 for up to four years
- **www.theiet.org/join**

What to do ASAP

1) Check you know **where** your lectures are
2) Check you know **when** your lectures are
3) Check your @cam email **regularly** for information
4) Check you can log onto the MCS (Managed Cluster Service)
   http://www.ucs.cam.ac.uk/desktop-services/mcs
5) Reread these slides, which are available at
   http://www.cl.cam.ac.uk/teaching/1415/Registratn/
6) Consider installing poly/ML on your own computer
   http://www.cl.cam.ac.uk/teaching/1415/ML/usingml.html