CSW
Computer Science Writing
Lecture 1

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Aims

Immediate aims:

- To help prepare for your project work
  - Planning your project
  - Planning your project report
  - Structuring the overall write up, how to do a literature review
  - Prepare for project presentation

Longer terms aims:

being prepared on how to plan work, write reports, make presentations in your future work

This is what people in industry do … (not coding!)

- Preparing written bids for work - must be clearly written, utterly convincing, well worked out time plan
- Giving a presentation to convince people to give us the job
- Running the project to a deadline - so need to schedule the work appropriately from that end point
- Making a presentation about the results to the client
- Writing a clear report of the results (which we have been greatly complimented on)

Learning Outcomes for the course

- To be able to make an informed choice of text preparation facilities, and use these to present written text clearly and accurately
- To be able to plan and execute an extended piece of writing – how to structure it, write it
- To be able to use literature effectively, including appropriate citation styles and constructing a critique
- to prepare and give a presentation on an academic subject, in a fixed time

Who's here, doing what?

- All 3Y0s (MEng) and MSc NCs:
  - Attend lectures and practical (on Latex)
  - Open assessment (lit review - 2 stages; due next term, Wk 3?)
  - Give presentation (on aspect of lit review, Wk 4?)

- All those taking PR3 (third year project):
  - Attend lectures and practical (on Latex)
  - Presentation (mark does not count, but good feedback will be given, good practice for project presentation)

Comments – on the open assessment

- Last year, assessment guidelines were ignored or misinterpreted
- The guidelines are very precise
- Divergence is heavily penalised
- Read the guidance material and follow it

Lectures

10 lectures/practicals:

- Thursdays 09:15 and 14:15 D/056 (Weeks 2, 3, 4)
- Friday 09:15 L/036 (Weeks 1, 2 ,3 and 4)

Whatever course you're on, you should (!) attend the lectures

“Guest” lectures

- Preparing a project using MS Word,
  - Alistair Edwards, 18th October (9:15am), 1st November
- Preparing a project using Latex
  - Jeremy Jacob, TBA
- Scientific method & basic statistics
  - Susan Stepney, 25th October (9:15am, 26 October

Practicals I

One practical session on Latex - TBA

Week 5 of Term - Presentations by PR3 students

Ignore the rooms in the timetable, I will book smaller rooms in the department

Practicals II

- Group of 5 or 6 students for a 50 minute session plus me and a PhD student
  - 5 minute presentation each
  - Timing strictly enforced
  - A couple of questions from me, Phd or fellow student
- Powerpoint (or equivalent) presentation - to be submitted 24 hours in advance, so I can load them all on a computer, check they run
- You may wish to give us a hand-out (to be discussed in the session on giving presentations)
- Feedback from demonstrators and me within two weeks

Practicals III

Topics for presentations (more details later):

- For PR3 students - one or two key papers from your project literature review, a critical analysis of these paper/s
- For all other students - a set of interesting papers will be provided as part of the open assessment

A silly interlude

If you are an MEng third year

- Stand on the right

If you are doing a PR3 project

- Stand on the left

If you are an MSc NC student

- Come to the front

AND THEN….

- Find one or two people from your side
- Sit down together (so you can talk)

There will be mini-discussions from time to time

- For now
  - Discuss what a computer science project means to you, what you are going/would like to do

WHAT IS A PROJECT?

Discuss what might constitute a computer science project

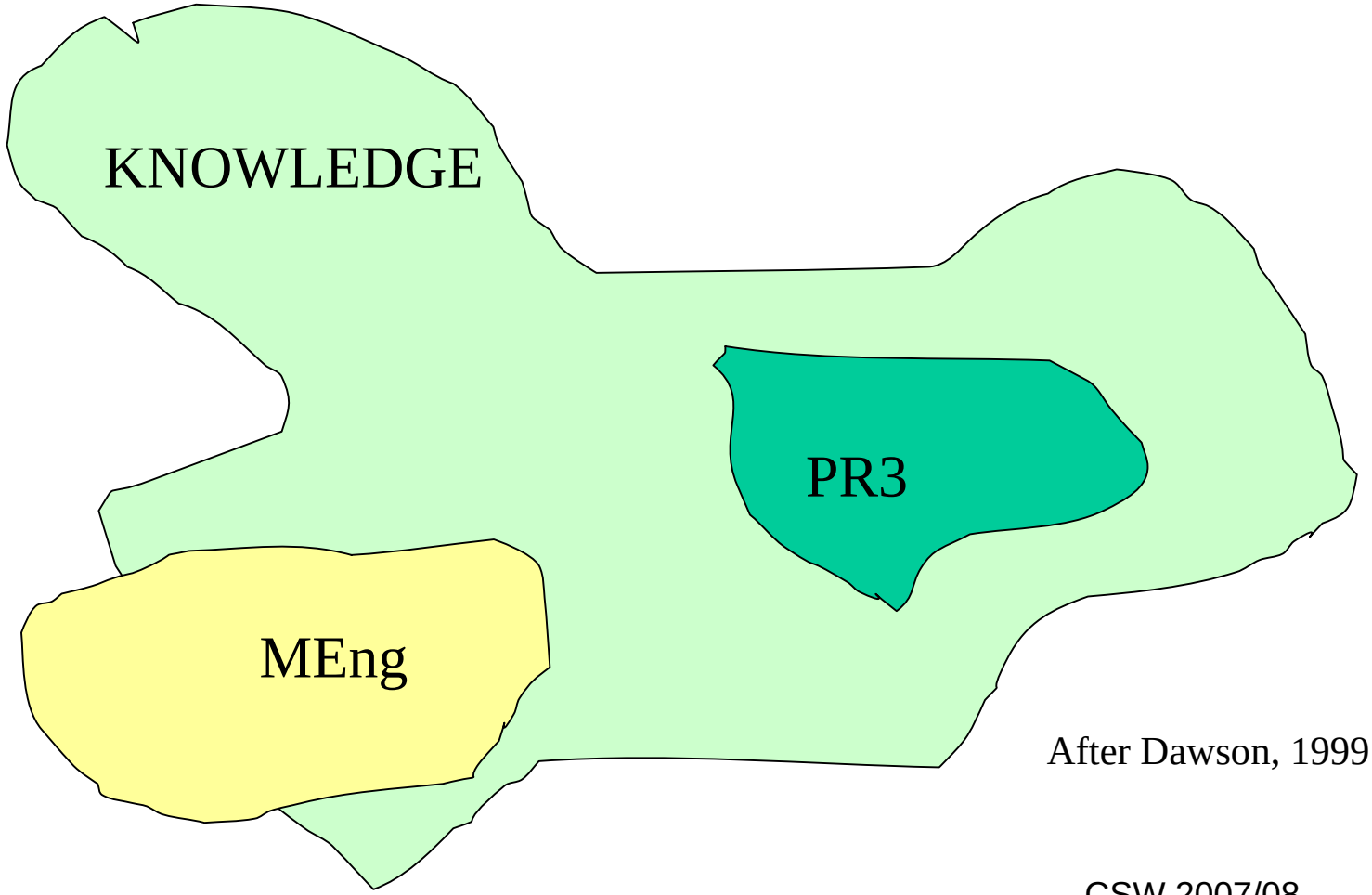
2-3 minutes: timer

What do you think….?

A project …

- Demonstrates your ability to conduct a sustained piece of work, use computer science techniques, following …
- An appropriate development lifecyle
- Usually:
  - Requirements - design - implementation - evaluation (don't forget evaluation!) - maintenance
  - Including producing some kind of "artifact" - software, hardware, training materials …
- BSc projects do not need to "increase knowledge", MSc/MEng projects do

Projects and Knowledge



After Dawson, 1999

Methods for projects

Different methods are appropriate for different projects:

- Software Engineering methods - agile programming, RAD, unified process etc
- Hardware methods for specification/design
- Research method: problem-hypothesis-experiment
- Algorithm design/proof: problem-plan-do

Method is very important

- In your project report, you need to justify why you chose particular methods - so think about this at the beginning, as you go along
- What alternatives are available to you?
- Discuss with your supervisor if necessary
- No-one expects you to be able to use a method perfectly the first time - you will make mistakes
- Turn that to your advantage in the write up

Using method …

- Very useful to be able to write about:
  - what you learnt about the method from doing the project
  - what went wrong
  - what you would do differently another time
  - What the inherent limitations about the method are

- Take notes as you go along, you won't remember all the problems, hassles, interesting things at the end

- Keep a project notebook, blog ….

Fitting a Project to a Lifecycle

- Design-and-build projects should fit easily
- Other projects:
  - Explain the goals, constraints, givens, literature
  - Write up the method: hypothesis, experimental design, plan etc
  - Write up and evaluate the results
  - Consider what maintenance might mean!

And MEng/MSc NC Projects…

- All the above apply
- More thoughtful and advanced in approach and content….
  - Systematic, comprehensive understanding
  - Critical awareness and evaluation
  - Forefront of the field; original knowledge or application

Initial planning for a project

- Who's used a Gantt chart?
- Not an acronym, as I assumed, Mr. Henry Gantt, mechanical engineer, developed the diagrams for the Hoover dam and other big projects
- Can do one manually with spreadsheet programs (Excel), or with nice automatic features

Gantt charts

Multi2Sim Gantt chart

Need:

- tasks
- for a complex project, might group the tasks into work packages with related tasks
- Milestones - key points when things will be achieved (e.g. “agree title with supervisor”)
- Deliverables - artifacts and components of artifacts to be produced - components of software, chapters/drafts of report

Critical Path Analysis and PERT charts

If you want to get really sophisticated, can do a critical path analysis

More complex than a Gantt, but should tell you more

What things can be done in parallel, what has to be done before another thing can start?

Pert Charts

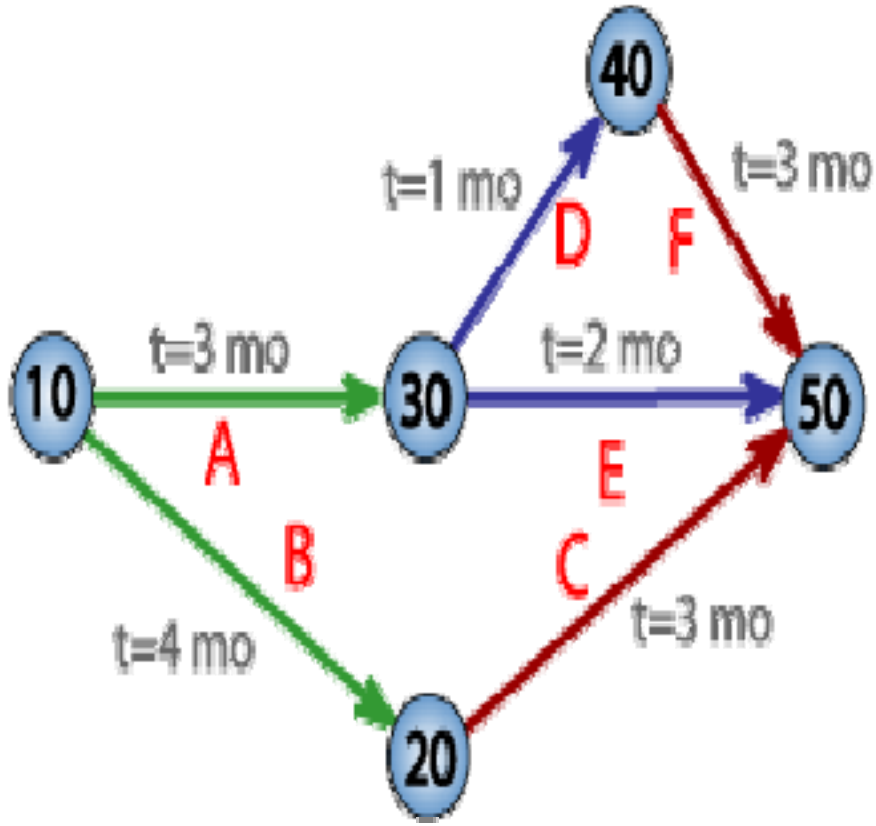
PERT = Project Evaluation and Review Technique

A, B, C … are the tasks

T = 3 mo … time needed to complete the activity

10, 20, … are the milestones

This project cannot be done in less than 7 months, assuming person-power to do C, D, E and F are available … otherwise longer



Do a Gantt for your project

Doing your first Gantt can be very daunting - knowing how long things will take is a stab in the dark

A stab in the dark is better than nothing

Have a go, be realistic, put in time for Christmas, exams etc

Make your supervisor do some work - ask for feedback on the feasibility of the first Gantt

Make your Gantt work for you!

- Do use the Gantt chart during the project
- It’s not the end of the world if you go a bit off the rails
- But then re-work the Gantt
- Don’t be afraid of discussing adjustments with your supervisor - get their opinion on the best course of action

But keep your first Gantt

- Make notes on why/how you misjudged things
- This can be useful in your write up
- But will also help you be more realistic when you start work (or continue further study) and need to do planning exercises again

Gantt and PERT resources

- More resources on Gantt and PERT charts will be on the web page