CSW
Computer Science Writing
Lecture 1

Steve King

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 problem classes / practicals
  - Open assessment (lit review - 2 stages; due spr/3)
  - Give presentation (on aspect of lit review, spr/4)

- All those taking PR3 (third year project):
  - Attend lectures and problem classes / practicals
  - Presentation (mark does not count, but detailed 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:

- Wednesday 11:15 V/045 (weeks 2 - 4)
- Thursday 10:15 B/B/006 (weeks 2 - 4)
- Friday 10:15 B/B/002 (weeks 1 - 4)

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

“Guest” lectures

- Preparing a project report using Word,
  - Alistair Edwards, 2/w/11.15
- Ethics and student projects
  - Alistair Edwards, 2/th/10.15
- Preparing a project report using LaTeX
  - Jeremy Jacob, 2/f/10.15
- Scientific method & Stats and graphs
  - Susan Stepney, 3/w/11.15 and 3/th/10.15
- Online literature resources
  - Tony Wilson (Library), 4/th/10.15

‘Practicals’ & Presentations

Thursday weeks 3-4 only: 12.15 or 2.15

Week 3: optional exercise sheet on LaTeX

Week 4: mandatory session on online lit resources

Week 5 of Term - Presentations by PR3 students

Presentations II

- Group of 8 students for a 50 minute session plus me and a demonstrator
  - 5 minute presentation each
  - Timing strictly enforced
  - A couple of questions from me, demo 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 demonstrator and me within two weeks – online?

Presentations 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 - instructions on choosing topic and papers will be provided as part of the open assessment

Time for some work!

- Look around
- Form a small group (2-4 people) that can easily have a short discussion: move around if necessary!
- 1. Find out which course (MEng / doing PR3 / MSc NC) everyone in the group is doing

AND THEN….

2. 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

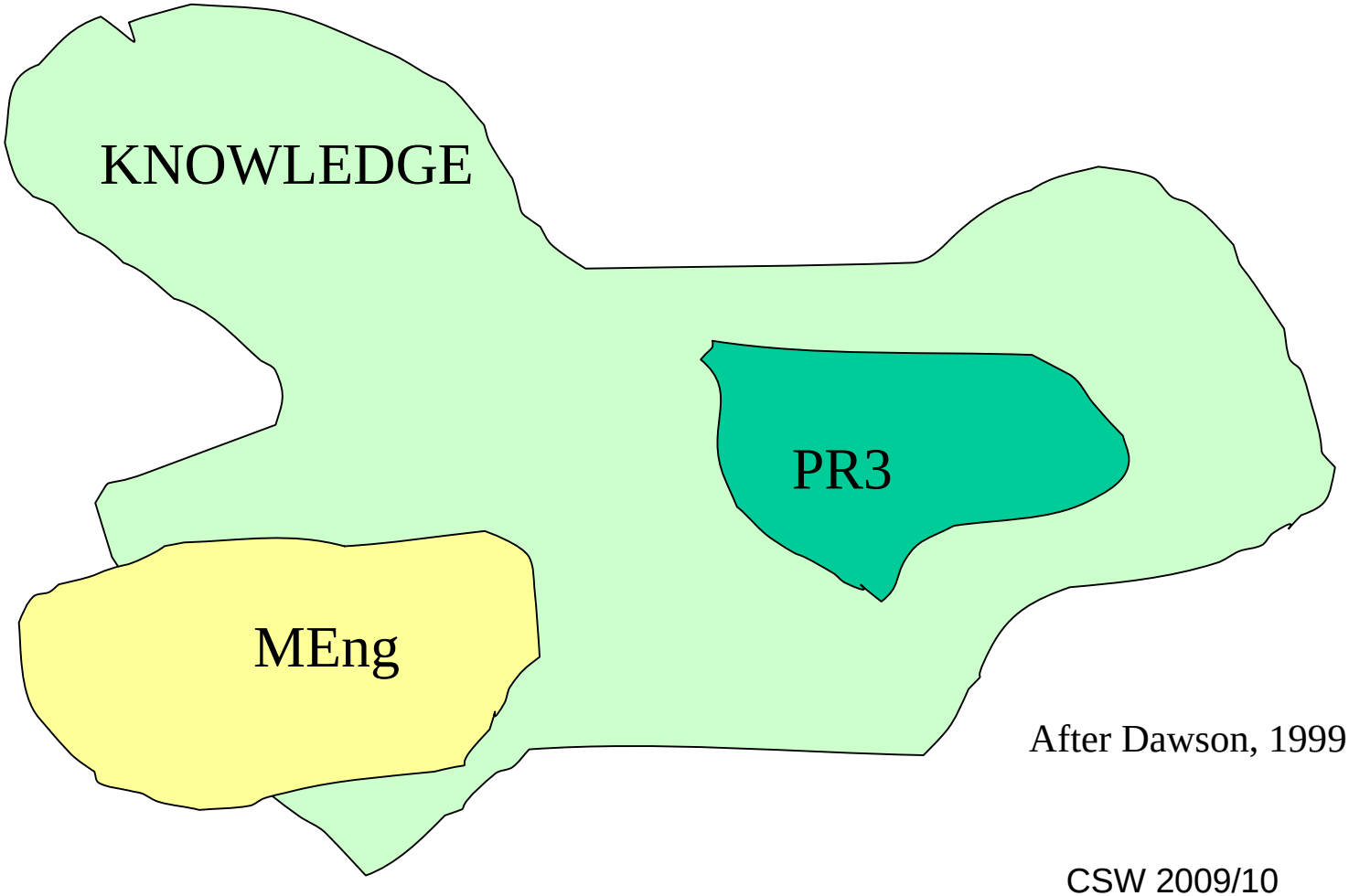
2-3 minutes: timer

What do you think….?

A project …

- Demonstrates your ability to conduct a sustained piece of work, use computer science techniques, following …
- An appropriate development lifecycle
- 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 has 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

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

Sample Gantt chart

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

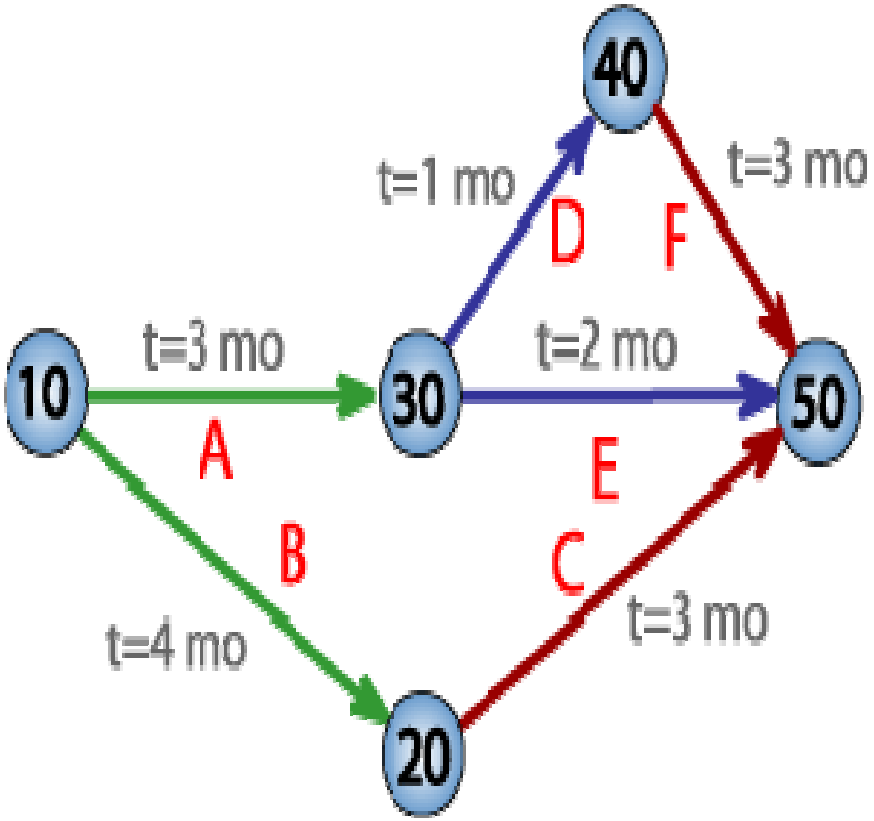
PERT = Project Evaluation and Review Technique

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, open assessments 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 are on the web page