# CSW
# Computer Science Writing
# Lecture 1

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(Based on a 2009 lecture by 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

# Learning outcomes for the course

- To be able to use text preparation facilities 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 the other students (on CS projects, PR3/4):
  - 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

- The guidelines are very precise
- Divergence is heavily penalised
- Read the guidance material and follow it

# Lectures

10 lectures:

- Week 1: Friday 15th October, 11:15, LMB/031
- Weeks 2, 3 and 4 (3 lectures per week):
  - Thursdays, 9:15 and 14:15, LMB/002A
  - Fridays, 11:15, LMB/031
- Exception: Week 3 Thursday, 14:15, lecture in CSE/270

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

# “Guest” lectures

- Scientific method & Stats and graphs
  - Susan Stepney, 2/th/9.15 and 14.15
- Preparing a project report using LaTeX
  - Jeremy Jacob, 2/f/11.15
- Ethics and student projects
  - Alistair Edwards, 3/th/9.15
- Turnitin
  - ASO, 3/th/14.15
- Online literature resources
  - Tony Wilson (Library), 3/f/11.15

**Check the full lecture timetable on the website!**

# ‘Practicals’ & Presentations

Tuesday weeks 3-4 only:

CSE/069&070, time 10.15 or 12.15

Week 3: optional exercise sheet on LaTeX

Week 4: mandatory session on online lit resources

Week 5 of Term - Presentations by PR3/4 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)

# Presentations III

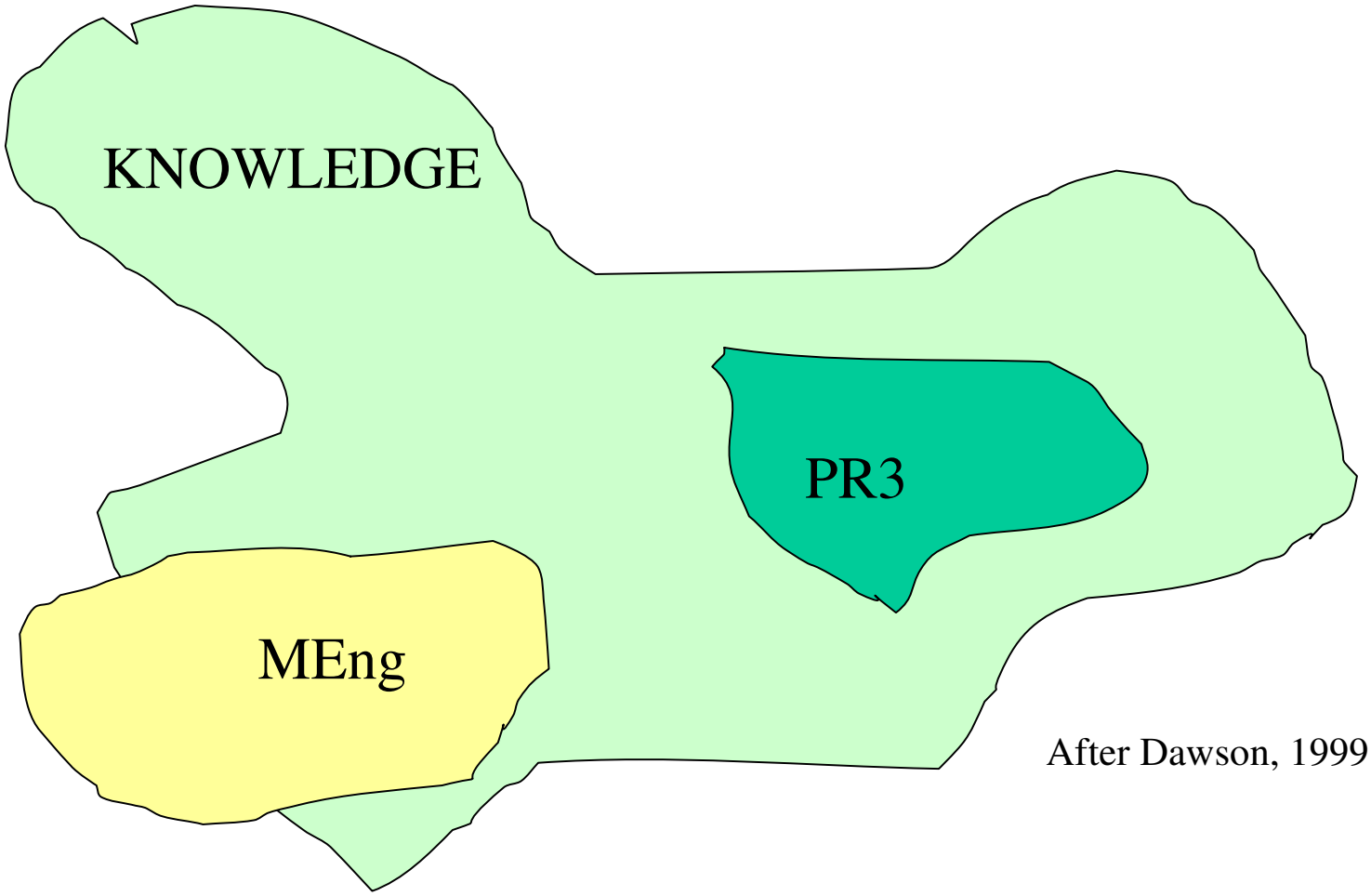
Topics for presentations (more details later):

- For PR3/4 students - one or two key papers from your project literature review, a critical analysis of these paper/s
- For all other students (MEng and MScNC) - instructions on choosing topic and papers will be provided as part of the open assessment

# What is 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:

  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

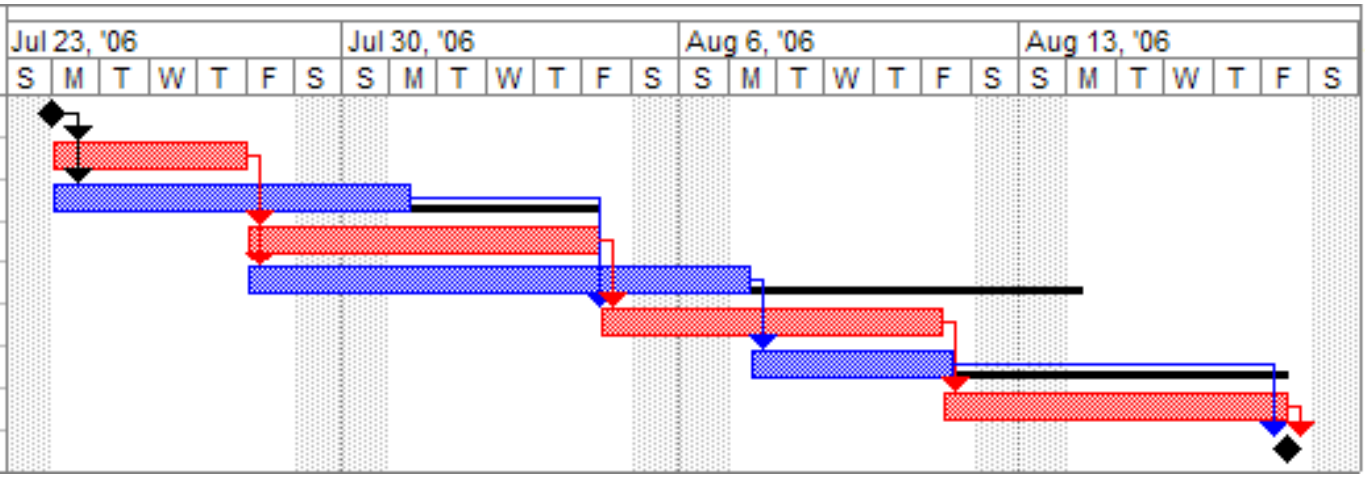
Need:

- 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

# Gantt charts

- **Example from Wikipedia**

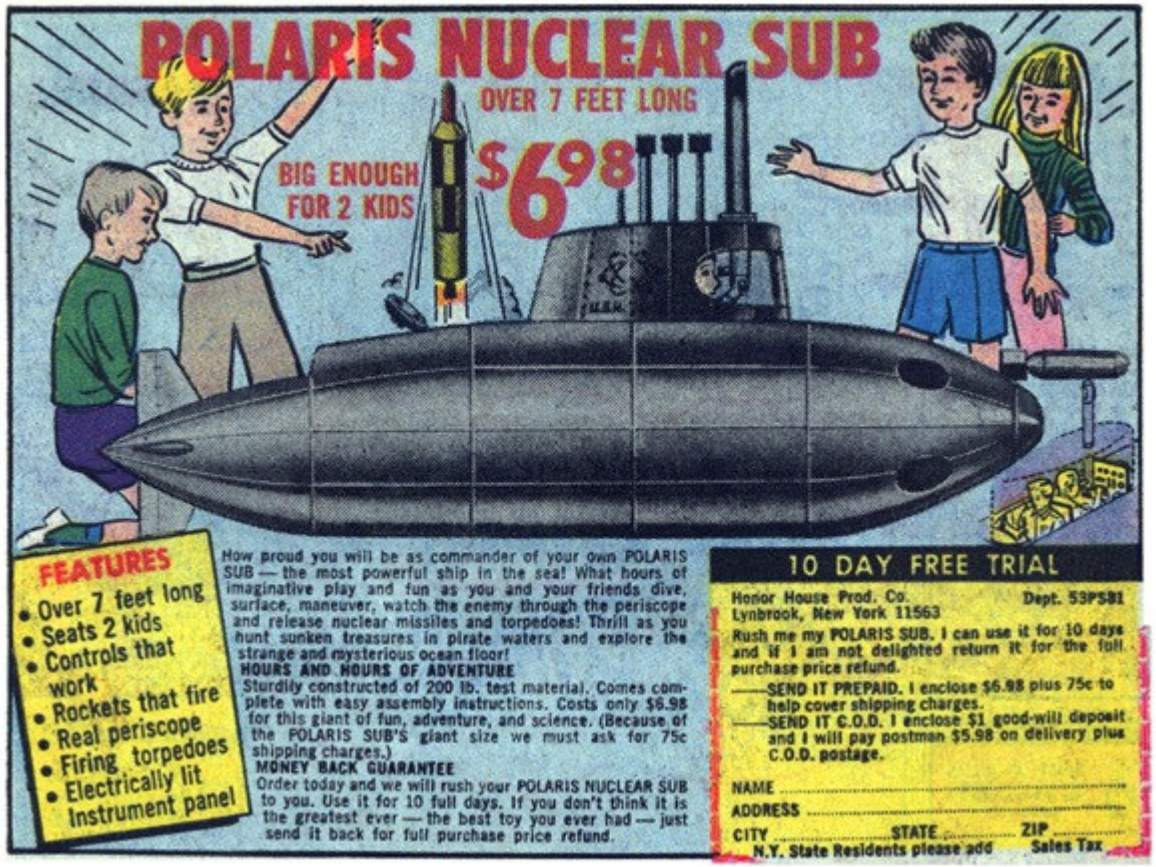
| ID | Task Name | Predecessors | Duration |
|---|---|---|---|
| 1 | Start | | 0 days |
| 2 | a | 1 | 4 days |
| 3 | b | 1 | 5.33 days |
| 4 | c | 2 | 5.17 days |
| 5 | d | 2 | 6.33 days |
| 6 | e | 3,4 | 5.17 days |
| 7 | f | 5 | 4.5 days |
| 8 | g | 6 | 5.17 days |
| 9 | Finish | 7,8 | 0 days |




**http://en.wikipedia.org/wiki/Gantt_chart**

# Pert charts

- First developed to support the U.S. Navy's Polaris nuclear submarine project (1957)




**www.comixstuff.com**

# Pert charts

- More complex than a Gantt
- Network diagram: some things can be done in parallel, some things must start after other...
- If you want to get really sophisticated, can do a critical path analysis

# Pert charts

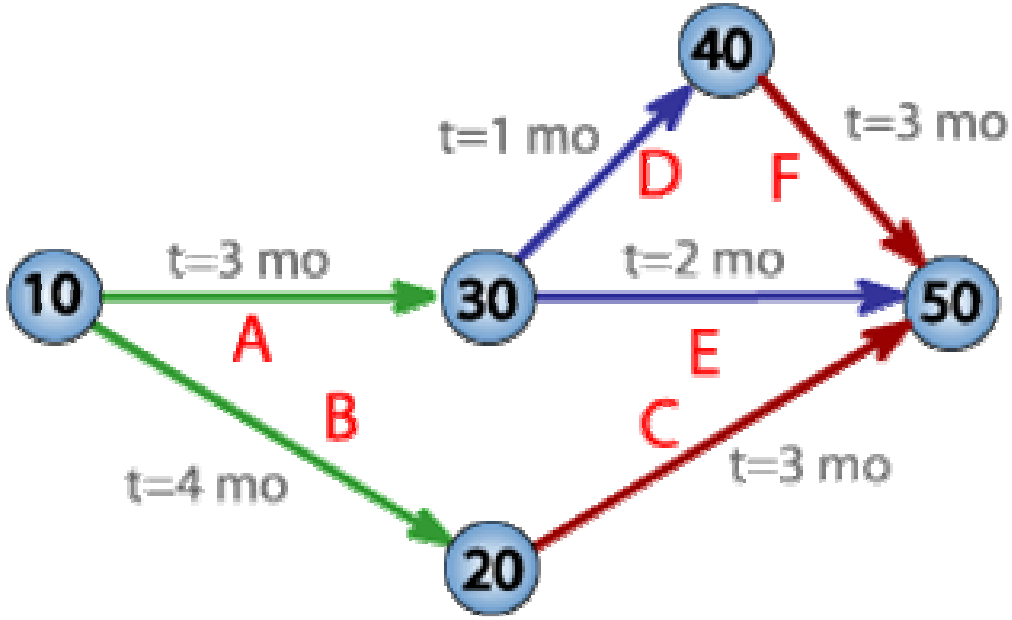
PERT = Project Evaluation and Review Technique

A, B, C … are the tasks/activities

t = 3 mo … time needed to complete the activity

10, 20, … are the milestones

Critical Path = the longest possible continuous pathway taken from the initial event to the terminal event. It determines the total time required for the project.




http://en.wikipedia.org/wiki/Program_Evaluation_and_Review_Technique

**Critical path = 7 months**

# 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