Welcome back!

Key points:

• exam is three papers + project dissertation
• **dissertation = quarter of total marks!**
• two weeks to get project proposal accepted

Goals of the project:

• demonstrate computer science skills
• design, implement, test something substantial
• select suitable methods and tools
• prepare a convincing report
Overseers

http://www.cl.cam.ac.uk/teaching/projects/overseers/

- Two per student
- Oversee selection of project and its progress
- Formally approve project and supervisor
- Advise on tools and approach
  - computing equipment
  - languages, libraries and tools
  - any special devices
- Overseers are not expected to suggest projects or find project supervisors
  - your Director of Studies is responsible for helping you select a project and its supervision.
Proposal Sign-off Requirements

- A named project supervisor
  - his/her signature required on cover sheet

- Project Resources Declaration
  - describe the equipment you will use
  - may include libraries or databases
  - name the person/people granting access: their signature is needed on cover sheet

- Your Director of Studies is happy
  - his/her signature required on cover sheet

- Both your Overseers are happy
  - they should have approved by email before you submit
  - they will formally sign to approve after you submit
  - cover sheet has space for their signatures.
The Project Proposal

- About **1000 words** and **A4**
- First page **must** summarise:
  - **The proposer:**
    - your name, college and user identifier
  - **The project:**
    - its title and the name of its originator
  - **Supervision arrangements:**
    - project Supervisor and Director of Studies

Then the main sections...

*Read the Pink Book thoroughly*
1. An introduction and summary of the work to be undertaken.

2. A description of the starting point.

3. Description of the substance and structure of the project: key concepts, major work items, their relations and relative importance, data structures and algorithms.

4. A criterion which can be used to determine whether the project has been a success.

5. Further envisaged evaluation metrics.

6. Plan of work, specifying a timetable and milestones.

7. Resources declaration.
Computers

- MCS Facility
  - many PC workstations
  - supported by Computing Service
  - dual boot into Windows or Linux

- Relying only on your own PC can cause problems
  - need PC backup plan (to MCS or otherwise)
  - genuine extract from a past project:
    Unfortunately my write up became corrupted on disk towards the completion date. I have had to rewrite the dissertation over the last 36 hours and this has resulted in a much smaller write up than the original (ie 4000 words as opposed to 10000 words).
Main sources:

- your own ideas
- supervisors and Directors of Studies
- previous years’ projects
- industry
- projects web page
- the best projects typically:
  - require learning/study/research,
  - use a complex central data structure or algorithm,
  - are amenable to quantitative evaluation.
Also: Supervisors’ Form: Wed 23rd May (4pm).
Microtimetable for choosing project

- **Phase 1** - Selecting a Topic
  - write 100 word outline of project idea
  - get overseers’ approval
- Email *Phase 1 Project Selection Form* to overseers
- **Deadline: Monday after Project Briefing**

*Overseers accept plain text emails and PDFs for the final drafts.*

*Include the information from final cover sheet on intermediate emailed drafts.*
Please complete this form and email it to both your overseers by 3:00pm on the Monday after the Project Briefing.

Phase 1 Project Selection Status Report

Name:
College:
User Identifier:
Director of Studies:

Please complete 1, 2 and 3 below.

1. Please write 100 words on your current project ideas.

2. Please list names of potential project supervisors.

3. Is there any chance that your project will involve any computing resources other than the Computing Service’s MCS and software that is already installed there, for example: your own machine, machines in College, special peripherals, imported software packages, special hardware, network access, substantial extra disc space on the MCS.

If so indicate below what, and what it is needed for.
Phase 2 – Filling in Details

- Write a few hundred words of description
- Devise a timetable, for example:
  - 10 two-week work-packages
  - first two might be preparatory work
  - last three writing your dissertation
  - practical work in the middle
  - progress report a part of fifth
  - identifiable deliverables and deadlines
    (Ideally have a primary success criterion
due in the Lent Term)
  - leading to submission in middle of May
- Determine special resources, check available
- Secure a suitable project supervisor
- Ask overseers to check details
- **Deadline: Friday, 1 week after briefing**
Fill out and attach to your proposal.

- describe requests to Computing Service for more resources (made via a web form)
- describe access to centrally-managed Computer Laboratory research machines (made via a web form)
- justify any experiments on human subjects
- indicate if you are using your own computer
- indicate plans to use specialist hardware or software belonging to industry or a research group
- optional risk assessment sheet: high voltages, knife throwing machines, ...
Human Subjects Approval

- Evaluation or other experiments involving human subjects requires approval by the department’s Ethics Committee.

- Getting your friends to test your software is an experiment on humans.

- Be careful with personal data (avoid data protection offences).

- Be careful about misleading your victims (avoid a conviction for fraud).

- Follow best practice in conducting this part of your evaluation (there are established methods for conducting HCI trials).

- You must fill in the box in on the cover sheet.

- Your supervisor must complete and submit an online form to the Ethics Committee for you.
Using Your Own Computer

- Write “I plan to use my own computer” in your resource declaration.

- Give its description and your backup plans. For example:

  A My computer: 3 GHz CPU, 4 Gb RAM, 300 Gb Disk, Linux OS

  B My contingency plans against data loss are that everything will be held under git on Bitbucket with daily checkpoints to my Google Drive and also weekly to SD Cards kept only for that purposes.

  C My contingency plans against hardware/software failure are that I can easily transition my work to the MCS ...

- You are warranting that you accept full responsibility for any hardware and/or software failure.
Phase 3 – Final Proposal

- Produce final copy including:
  - Coversheet as first page,
  - Human Subjects page if necessary,
  - Risk assessment page if necessary,
  - Body of proposal, including milestones and timetable,
  - Resources declaration.

- Secure the signatures:
  - project supervisor
  - Director of Studies
  - proprietor(s) of special resources

- **Deadline:** Friday, 2 weeks after briefing:
  - hand in by Noon on 20th October 2017.
Starting Work

- Acquire a project log book
  - very useful when writing up

- Try to keep to the timetable

- Continually review progress

- Consider goals & organisation immediately
  - in parallel with learning needed skills

- Think early and often about evaluation
  - comment from examiners on evaluation

My experience from four years of reading dissertations is that there is one failure mode exhibited by roughly a third of dissertations. This failure mode is exhibited as excellent Preparation chapter, adequate Implementation chapter, appalling Evaluation chapter.

I think this failure more often reflects students poor planning rather than poor evaluation skills. It usually comes across as: I spent lots of time thinking about my project, didn’t manage to complete the implementation properly and had no time left to do any sort of evaluation.
Lent: Presentation + Progress Report

• 300 to 500 words on A4 paper
  – your name, crsid and project title
  – names your Project Supervisor
  – names your Director of Studies
  – names an independent domain expert that has confirmed to you DoS that they may be called upon by the examiners if needed
  – describes what work has been completed and how this relates to the timetable and work plan in the original proposal.

• Hardcopy handed in to Student Admin.

• You may also request an additional private meeting with Overseers.
Progress Presentation

- Five minute, **compulsory**, presentation to your overseers and overseeing group.

- Overseers will write a mini-report of a few sentences. This is sent to supervisors and DoS and **will be available to the examiners**.

- Format:
  - Feb 2018: Thu 8, Fri 9, Mon 12 or Tue 13
  - at 2pm
  - projection from laptop recommended
  - request overhead projector if needed
  - oral report should be carefully rehearsed
  - use at most 4 slides

- **making this presentation to your peers is a necessary part of your accredited course work for the degree.**
• Don’t leave things until the last minute.
• Start writing the project report early.
• Make sure you can create a PDF that is less than 15 MByte and preferably has embedded fonts.
• Missing the submission deadline results in marks being deducted!

\[
penalty = \frac{10 + n}{40} \times mark
\]

\( n \) is the integer part of number of days late
- kicks in immediately after deadline
- minimum of a quarter of marks lost
You retain full copyright and ownership rights over your work.

Everything you submit must be free from IP restrictions (e.g. NDA).

Your source code will not be used for any purpose other than examination and will not be distributed outside the Computer Laboratory.

You normally grant the University the right to limited, not-for-profit distribution of your dissertation, such as placing a copy in the departmental library.

Precise information in Pink Book or from DJ Greaves.
Supervisors’ Report Form

- Signed by your supervisor and DoS (if different).
- Explains how much supervision was given and what, if any, demonstrations were shown.
- The form may be used as a basis of whom to call for Viva. *Not doing a demo means a viva is likely!*
- You must ensure it is given in as soon as possible after submission.
- Certainly before the deadline on the following Wednesday.
Viva Voce Examination

• The examiners will announce the date of Vivas

• If you will be away on that date, you must inform the examiners via your tutor

• You may be asked any question:
  – did your project really work?
  – did you really write this function yourself?
  – etc...

• Most years, few people are called for viva.
Aims of Final Dissertation

• Demonstrate ability to plan and execute a large project

• Show understanding of the project’s area of Computer Science

• Demonstrate ability to select appropriate tools (languages, algorithms, data structures etc.)

• Present evidence that the end result works as claimed

• Show ability to prepare a well-structured and readable document

• Demonstrate knowledge of best professional practice, ethical factors and potential commercial and societal impact.
## Compulsory Dissertation Format

- Aim for about 10000 words
  - **Must** be less than 12000 words (excluding any appendices)

- Required form:

<table>
<thead>
<tr>
<th>Required Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Sheet</td>
</tr>
<tr>
<td>Proforma</td>
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<tr>
<td>Declaration of Originality</td>
</tr>
<tr>
<td>Table of Contents</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
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<tr>
<td>Chapter 2: Preparation</td>
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<tr>
<td>Chapter 3: Implementation</td>
</tr>
<tr>
<td>Chapter 4: Evaluation</td>
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<tr>
<td>Chapter 5: Conclusions</td>
</tr>
<tr>
<td>Bibliography</td>
</tr>
<tr>
<td>Appendices</td>
</tr>
<tr>
<td>Index</td>
</tr>
<tr>
<td>Copy of Project Proposal</td>
</tr>
</tbody>
</table>
• Dissertations must include a declaration:
  – immediately after the Proforma
  – on the same page, if room

• Must have exactly the following syntax:

  I [Name] of [College], being a candidate for Part II of the Computer Science Tripos, hereby declare that this dissertation and the work described in it are my own work, unaided except as may be specified below, and that the dissertation does not contain material that has already been used to any substantial extent for a comparable purpose.

  Signed [signature]
  Date [date]

• *Pink Book* has more explanation and details
Assessment

- Each dissertation is read by at least two examiners
  - and possibly by an additional expert
- Each dissertation is marked as follows:

<table>
<thead>
<tr>
<th>Marks</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Practice and Presentation</td>
<td>14%</td>
</tr>
<tr>
<td>Introduction and Preparation</td>
<td>26%</td>
</tr>
<tr>
<td>Implementation</td>
<td>40%</td>
</tr>
<tr>
<td>Evaluation and Conclusion</td>
<td>20%</td>
</tr>
</tbody>
</table>

- Presentation: credit for literacy and narrative quality (fonts/layout yield marginal credit)
- Other guidelines at the end of Pink Book.
Submit:

1. Two electronic (PDF) copies of your dissertation. One contains just the text that is subject to the word count limit. These will be electronically scanned for plagiarism and/or word count.

2. A zip of all source files you created or substantially modified and perhaps example output files that substantiate your claims. You do not need to submit supplementary materials required to re-create a working version of your project (these might be under NDA etc.).

Examiners may only look at the five dissertation chapters, so do not rely on appendices or the code zip for credit.
Selection Advice — Reiteration

- Choose something with significant technical content.
- Ideally implement some complex algorithm.
- Do not do something big yet simple.

- Choose something interesting.
- Phrase a question or two at the outset.
- Answer the questions in the conclusion.

- Choose a project amenable to structured evaluation.
- ‘It worked according to plan’ is not sufficient.
- Components ideally separately testable.
- Composition ideally evaluable using several metrics.
Good luck!

David Greaves