Everything You Always Wanted To Know About MSc Projects

(well, at least a step in the right direction!)

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Overview

- Working towards your goal
  - How to work on your project
  - Getting the most out of your supervisor
  - Preparing your dissertation
- The goal itself
  - What are the examiners looking for?
  - What's the deadline?
  - How does my project get marked?

The End Result

- What do I hand in?

  You hand in your dissertation, and you also (usually) give a demonstration of any software/systems you have produced.

- When do I hand it in?

  The official deadline is the last Friday before the Autumn semester starts (Friday 13th September, this year). In practice, it is very strongly recommended you aim for the end of August.

The End Result

- Who marks my project?

  Your supervisor, one other member of staff, and also the external examiner.

- How do they mark it?

  You don't get a grade like for units. The markers are looking to see whether, overall for the course, you get a pass, fail, or pass-with-distinction.

The Dissertation

- How important is the dissertation itself?

  Credit is given both for what you have done and for how well you write it up. However the evidence as to what you have done in your project is the dissertation itself! So it is important.

- How long should the dissertation be?

  A typical dissertation ends up around 40-50 pages with up to 20 pages of appendices. However it is better to concentrate on presenting your work well rather than trying to "pad it out" or "squish it up", so don't take the guidelines as hard limits

What Examiners Look For

Obvious:

- they are looking to see what you have *done* in your project

Not-so-obvious:

- they are also looking to see that you have *thought* about what you have done. Very important!

Showing thought

The following should all be included in your dissertation:

- Specification
  - *Clear problem statement: state clearly what it is you have chosen to tackle and why*
- Background
  - *Show awareness of what other work has been done in your project area: refer to a good selection of available literature in the area. Has anyone else done something similar? Analyse the strengths and weaknesses of existing work.*

Showing thought

- Approach and solutions chosen
  - *Don't just say what you did, but also why. Were there difficulties with your chosen approach(es)? How did you resolve these?*
  - e.g. Compare these three approaches:
    - *"I chose Java because I knew it already and couldn't be bothered to learn an existing language"*
    - *" "* (no statement at all - the student obviously didn't even think about which programming language would be best)
    - *"I chose Java because its widget-making facilities perfectly suited the widgets I was going to need to make"*

Showing Thought

- Testing
  - *Is it appropriate to do some testing (almost always yes!)? By yourself or do you need testers? Did you carefully plan the testing? How many testers were there and what evaluation were they asked for? What did they think of it? Is it user-friendly? What improvements did they suggest?*
- Evaluation
  - *Does your program work? How far does it achieve what you set out in your problem statement? Are there improvements that could be made? Do you have results that you should analyse (e.g. from testing)?*

Showing Thought

- Conclusions
  - *What did you have to learn in order to do this project? What have you learnt from doing your project? Was it difficult? Were there unsurmountable difficulties? Did you run out of time? How have you benefitted from the project? If you worked further on it, what improvements would you make? With hindsight, would you have done it differently?*

Now that we've covered what the goal is, we look at how to work to achieve that goal...

Working on your project

Bearing in mind you are going to be writing-up later on, be very kind and helpful to yourself during your project work, to save yourself extra unnecessary work later on:

- Keep a project diary/notebook/folder (or some form of careful record of your progress)
  - *When you are writing up and you want to put all your literature references in your dissertation, you **don't** want hassle finding them again*
  - *Record why you did things, not just what*
  - *Projects have good and bad days. When you're going through a bad day, or week, and it feels like you've not done much, looking back at your diary can help boost your confidence that you have been progressing*

Working on your project

- Keep backups of your programs, data, and documents, labelled clearly, in a separate place
  - *Yes, very obvious, but it does happen to people every single year so it is worth mentioning!*
  - *Make separate back-ups of your program(s) every few days, in separate places, so that you have a complete history. This is useful if you get into a muddle and want to go back to a previous version that you know worked ok*
  - *Paper printouts of programs are also useful in case of electronic hassles, not to mention useful for perusing quietly in the library/pub/garden*
- Layout and comment your program(s) well at the time of writing, not later
  - *You may well quote program extracts in your dissertation*

Working on your project

- You may find it helpful to have several independent "threads" of your project for you to work on
- e.g.
  1) Doing some programming
  2) Research into background (literature, other software)
  3) Designing what the user interface is going to look like
  - *Whichever your preferred way of working, this means if you get stuck/bored/fed-up with whatever you are working on, or maybe you need your supervisor's help to proceed, you still have something else you can work on in the meantime.*

Working on your project

- Communicate with your fellow students
  - *See who, if anyone, is working in the same sort of area as you, or who is using the same software. You may be able to have mutually beneficial discussions, or be able to swap hints, URLs, and other resources.*
  - *Need someone to test your program? Find someone else who wants a tester for theirs and do some mutual back-scratching.*
  - *It is very useful for someone to read a draft of your dissertation and comment on it. Find someone who will do that for you if you do that for them.*

Getting the most out of your supervisor

- Using your supervisor well is important to producing a good MSc standard dissertation.
- Besides the supervisor's obvious role in providing planning, technical and presentation advice for your project, a couple of other points to consider:
- You only have 3 months, and your supervisor can make sure you don't go off in the wrong direction, either during the project work, or during the write-up, so don't avoid supervision.
- Ideally not only will you benefit from your supervision, but your supervisor will also benefit from you: MSc projects can be very interesting and informative.

Good supervision

- Have regular supervisions
  - *Between once and twice a fortnight is good.*
  - *If a regular meeting time is awkward, then at the very least, at the end of each supervision make sure you know when your next one is scheduled - nothing like knowing when the next supervision is to make you feel like doing some work!*
  - *Also having an appointment is reassuring if you haven't managed to get hold of your supervisor for a while.*
- Communicate well between supervisions
  - *Is it easier for your supervisor to be contacted via email, phone or in person?*
  - *Might your query need information looked up (email?)?*
  - *Or is your query more interactive (phone/personal visit?)?*

Good supervision

- A little preparation for supervisions can be useful
  - *Try standard debugging techniques to find out why your program doesn't work before asking your supervisor*
  - *For program queries, make sure your supervisor can see and run a copy of your program (e.g. on a disk)*
  - *If you have a query that your supervisor isn't going to instantly know the answer to, then letting your supervisor know in advance (if possible), may get you an earlier answer*
- If you are not sure whether you are progressing well, it can be very helpful to ask your supervisor to check

Good supervision

- It is helpful to know about your supervisor's timetable and holiday plans
  - *It can help both you and your supervisor if you don't contact them at times when they are unavailable, and saves you worrying when you are next going to get help*
  - *Make sure you have plenty to be getting on with when your supervisor does go to a conference / on holiday (you don't want to get stuck in the meantime)*
- Similarly, make sure your supervisor is aware of when you are unavailable for any length of time
  - *We supervisors do get concerned if students disappear into thin air!*

Good supervision

- If something unexpectedly affects your work (e.g. illness, bereavement), do tell your supervisor
  - *They may be able to help or advise you how best to proceed as far as your project goes*
- Give your supervisor time to read your drafts
  - *You may consider 24 hrs plenty of time but your supervisor won't agree if they are away for a couple of days or have several students' drafts to read!*
- Hopefully your relationship with your supervisor will be a good and productive one.
  - *If you do have problems, you can talk to the MSc course director (Dr. Jones), or if Dr. Jones is your supervisor, to another member of staff.*

Preparing your dissertation

There are various approaches and ways to think about the write-up of your work. Different ways suit different people. A few useful topics:

- The 6Ws
- Structure and Content
- Top-down approach
- General writing tips

6 Ws
Why, who, what, how, when and where

These are general principles to consider when writing any document. Considering these for MSc projects:

- Why? (the purpose of the document)
  - *Obviously "to pass my MSc", but there are other reasons*
  - *You probably want a record for yourself*
  - *The dissertations are also available for subsequent years of MSc students, some of whom may be interested in your project!*

6 Ws

- Who? (the readers)
  - *What background knowledge and experience do the readers have? What are they looking for in the document?*
  - *Obviously, your primary readers are the examiners. For background knowledge and expertise, aim it at the level of someone who is knowledgeable about computing, but not a specific expert in your topic area*
  - *In practice, try imagining explaining your project to a fellow MSc student*

6 Ws

- What? (contents)
  - *see next section*
- How?
  - What style of writing is most appropriate?
    - *Formal but not stiffly so or using overly-long words. Don't use slang, otherwise your work dates very quickly*
  - What diagrams/tables are you going to need?
  - What tools (software) are you going to need to use?
    - *Are you going to need to plan time to get sufficiently acquainted with it/them?*

6 Ws

- When? (writing plan)
  - *You should have started writing by the beginning of August.*
  - *Which to go for, the all-in-one-go approach, or the incremental approach (in parallel with your project work)*
- Where?
  - *Where is best to work to avoid interruption?*
  - *What information/facilities will you need to hand?*

Structure and Content

- Planning a good structure is vital.
  - *You need an overall view before you start writing*
  - *The better the structure, the more readable your dissertation will be*
- Put yourself in the reader's shoes when deciding what to put in where
  - *View your project with the eyes of someone who doesn't yet know about it (try!). What are the main topics they are going to want to know about?*
  - *Bear in mind when ordering your chapters which sections the reader will or won't have read already*

Content

Brief outline (more detailed information in notes):

- Cover sheet
- Contents, Acknowledgements
- Abstract *(a paragraph to summarise your project)*
- Introduction *(write this first and last)*
- …main chapters...
- Conclusion
- Appendices
- Glossary?
- References/Bibliography *(make sure this isn't too short!)*

Useful tip: go and look at previous dissertations!

Different writing approaches

Don't use a "diary"-type structure

- *The reader wants an overall picture, not a day-by-day account of what went wrong next…!*

After outlining the overall structure,

- A "fill in the gaps" approach deals with the whole of one section before moving onto the next section
- A "top-down" approach starts with the outline of the structure and adds more and more detail, then polish, to all the sections

Writing tips

- Plan before writing
  - *Having a clear outline makes it easier to fill in the gaps*
- Ignore the language
  - *If you find it difficult to put pen to paper, don't worry about how to say it beautifully, just throw words at the paper to get in black and white roughly what you want to say.*
  - *It is easier to refine and polish words in front of you than to get it right first time*
  - *Plus if you have to scrap that section later putting a lot of effort into getting the grammar/spelling right is wasted*
- Write then rewrite then rewrite. And practise!
  - *A lot of "polishing" can improve your writing a lot*

Writing tips

- Be positive not negative
  - *Don't put yourself down. Don't be inaccurate either, but be aware there's more than one way to phrase things.*
- *e.g.*
  - *Going on and on too much about bugs in your program makes you seem incompetent. If they are there, mention them, but don't make a big song and dance about it*
  - *Compare one student's statement "I just happened to come across this web site" with the truth, that the web site had been deliberately searched for by means of a search engine*

Writing tips

- Don't be too egotistical
  - *Sometimes the word "I" is appropriate to use, but usually not too much*
  - *"I did this", "I did that", all over the dissertation, doesn't come over too well to a reader. They are not reading your dissertation for a narration of what you did, they are wanting an overall view of your project.*
- e.g.
  - *"I chose Java because…" could be "Java was chosen because…"*

Writing tips

- Find readers for your draft (besides your supervisor)
  - *Offer to proof-read someone else's if they will do yours*
  - *Ask specifically what you want them to check - the level of explanation? Spelling? Grammar? Clarity?*
- Use a style with dated footnotes
  - *Very useful when producing drafts and wanting to see which document you are looking at!*
- Don't forget to spell check and grammar check, at the very end of producing your dissertation.
  - *Nothing gives a bad impression faster than poor spelling and bad grammar. There are computers and other resources to help you - use them!*

Other resources

Notes:

- –MSc Dissertation Guidance notes handed out give more detailed information (also available from the IT pages at **`www.cs.stir.ac.uk/~sbj/it/projects`**)
- –The notes from this talk

Books:

a wide selection, so here's a few available in the library:

- –Carey, G.V. (1971) *Mind the Stop*
- –Barass, R. (1978) *Scientists must write*
- –Morris, J.E. (1966) *Principles of Scientific and Technical Writing*

Other Resources

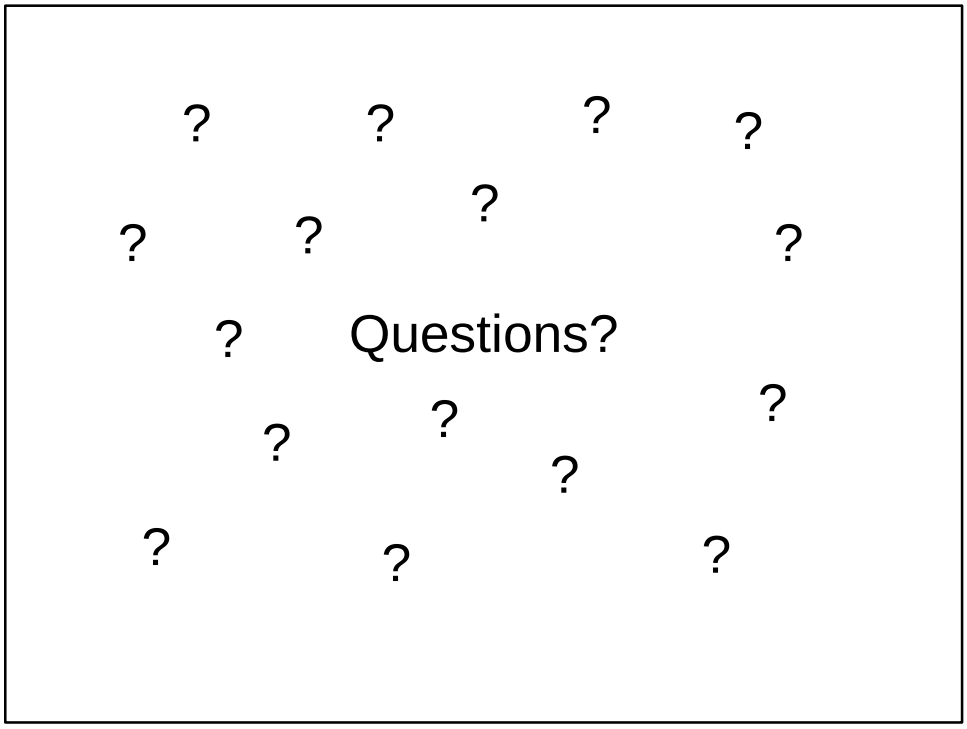
Web sites:

the assortment of help available includes

- – how to write dissertations
- – how to search the web effectively
- – grammar and style
- – how to cite references for bibliographies

A list of links is available at

`www.cs.stir.ac.uk/~scu/reference/projects/`


Questions?