How to write a dissertation

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How to write a dissertation

what
why
when
who
how
WHAT is the dissertation?

a document of about 10,000 words
describing your project
in a carefully prescribed format
worth a quarter of your final mark
Due 12 noon on Friday 15 May 2015
Vivas on Monday 15 June 2015
Length

Maximum of 12,000 words
Including main text, tables, footnotes
Excluding appendices, bibliography, photographs, diagrams

Aim for 10,000 words
Reactions to the word limit

A. 10,000 words – yeah, OK.

B. 10,000 words! – I’ll never be able to write that much!

C. 10,000 words??!! – I’ll never be able to fit it into 12,000 words, let alone 10,000!
Advice for terse writers

It would be very hard to describe a Part II project properly in under 7,000 words.

So write your 7,000 words as best as you can.

Then see when you can improve your core by adding more words:

- Longer explanation of the key algorithms?
- More results?
- More detailed analysis of the results?
Advice for verbose writers (I)

The best project write-ups fit nicely within the 12,000 word limit, rather than feeling squashed.

What are the key points you need to cover to get the marks? – cover these.

What are the fascinating but largely irrelevant side issues? – drop these.

It is especially easy to write too much in the Introduction and Preparation chapters.
Advice for verbose writers (II)

You do not have to explain every function you wrote, every data structure you use, every book you read, and every interesting idea for extensions that you had.

If all else fails, write too much and then ruthlessly cut it down, preferably with the help from your Supervisor (and/or Director of Studies).
Advice for all

What are the key points?
make sure you cover these
some ideas for key points:
what did you set out to do?
what did you actually do?
how did you do it?
what were the results?
how good were the results?

Always remember who your readers are
three examiners!
It’s not a diary

it is a report not a diary
don’t write it in the order you did it
write it in the order that will make
most sense to the reader
Over 3000 dissertations so far

every Part II student has had to write a dissertation
WHY?

You will write many reports, this is good practice
You will be judged on the dissertation, not directly on your program
You need to present your work as well as possible
It is worth a good proportion of your final mark
Finish programming, testing and results gathering by end of Lent Term at latest

Finish complete draft well before Easter Term

Give to supervisor and Director of Studies to read

Correct and submit 2 weeks before deadline

Deadline: 12 noon, Friday 15 May 2015
Penalty

If you submit past the deadline, you will be docked 25% of the mark with a further 5% of your mark docked for each subsequent day late.

This isn’t an idle threat – we do it even if you are just one minute late.
Who are you writing for?

Three Computer Science lecturers

You may assume that they are intelligent

They know a lot of computer science so they are not ignorant

They do not know the detailed area of your project so you need to tell them about it

They prefer good writing

They will read your dissertation fairly quickly
They read quickly?

Each examiner has to read 50 Part II dissertations in 2 weeks

I can read 15,000 words/hour if it’s interesting!

So expect the examiner to spend between $\frac{3}{4}$ hour & 1 $\frac{1}{2}$ hours on your dissertation
Important corollaries of this

Be clear, be concise, tell them what you want them to know, do not expect them to realise how clever you are by osmosis.

Say things up front, don’t hide interesting stuff, you are not a mystery writer or a magician.

Do not expect them to plough through pages of boring gory detail.

Do not use code extracts when prose will do a better job.
Provide signposts

Your reader needs to know why they should bother to read each bit of the dissertation

You should tell the reader

Where you are going
Why you are going there
How you are going to get there

- Data structures  1 §
- Main algorithm  2 §
- Results              5 §
Say everything three times

Give an overview of what you are going to say
Say it
Summarise what you’ve said

This applies

To whole dissertation
Ch. 1, Ch. 2–4, Ch. 5
To each chapter
introduction, content, summary
To each section in a chapter
WHO should proof read it?

Supervisor

obviously

Director of Studies

if he/she has time

Friends

provided they aren’t also overloaded with work
Allow sufficient time

Your supervisor and Director of Studies are busy people so:

Allow them enough time to read and comment (say 2 weeks) so they can fit it around their other commitments

Use them wisely – do not give them a draft that you haven’t checked yourself

Do not assume they’ll read more than one draft

**NEVER** give them a second draft if you haven’t incorporated their corrections from the first draft!
Tools

Microsoft Word
\LaTeX
your own favourite word processor
whichever tool you use:
set up a template of the whole dissertation straight away
ensure that you can include figures, photos, equations, etc (whatever you need)
ensure that you can print it
find somewhere to get it bound
Microsoft Word

learn to use styles (Format menu)
they will help you keep your typesetting consistent (e.g. all second level headings in the same typestyle)
make it easy to get section numbers automatically and correctly
difficult to typeset large amounts of mathematics efficiently
including figures neatly is often a challenge
easy to include figures in a clunky way
\LaTeX

similar to a programming language
gets all the typesetting right for you automatically
easy to handle equations & tables
including figures works well, once you know how to get it to work

Martin Richards has provided a collection of files that constitute the basis of a \LaTeX dissertation:
www.cl.cam.ac.uk/~mr/demodiss.tar
Structure – five chapters

1. Introduction: 2–3 pages
2. Preparation
3. Implementation
4. Evaluation
5. Conclusion: 1–2 pages

see the pink book for details of what should go into each of the five chapters

www.cl.cam.ac.uk/teaching/projects/pinkbook.pdf
Mark allocation

the pink book tells you how marks are allocated and what the examiners want to see

Introduction & Preparation  26%
Implementation  40%
Evaluation & Conclusion  20%
Presentation  14%
Introduction

Make it clear in the first paragraph what your project is about & how well you’ve done it

e.g. “My project concerns the creation of a new operating system. My OS is based on quantum uncertainty. I have successfully implemented the heart of the new OS, which I have demonstrated running a range of key operations. This implementation fulfils the requirements of my core project proposal and one proposed extension: recovering deleted files through a time warp mechanism.”
Preparation

“work done before code was written”
show evidence of planning
show evidence of good software practice
explain any background

the nature of this chapter will vary greatly between dissertations
Implementation

What level of detail?

Too little detail

“I wrote a class which implemented public key cryptography using the new BWR algorithm.”

you need to tell the reader something about how you implemented this clever algorithm

Too much detail

“My BWR cryptography class contains six methods. The first method is called X, it has four parameters called A, B, C and D and returns an E. Parameter A is of type F, it indicates to method X exactly how many…”

but not so much detail that they lose the will to live
Evaluation

Many projects fall down on evaluation
You may have the most fantastic implementation ever, but you still need to evaluate it
Allow 2 weeks for evaluation:
  to get results
  to analyse results
  to get screen shots, output logs, photos, if appropriate
Conclusion

Make it clear in the first paragraph what your project was about, and how well you’ve done it.

Also say what you’d do differently if you did it again
Presentation: 14% of the marks primarily for being literate and tidy no need to spend hours on advanced graphic design or page layout but you do need to ensure that: it is spell-checked grammar is reasonable informal hints can be found at: www.cl.cam.ac.uk/~pr10/teaching/dissertation.html
Final words

read the pink book
it tells you what you need to write
prepare a complete template before starting to write
ensure that you know how you’ll get it printed & bound
write clearly at an appropriate level of detail
aim to submit 2–3 weeks early
read the pink book
again, in case you missed something