Mathematics Project : Project Planning and Referencing

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Oct 2014

Introduction

This is an outline of what we will discuss

Planning

- The need for a plan
- Things to consider when planning
- Planning as writing schedule

Referencing

- Why is referencing important
- The need for a consistent system
- The Harvard referencing system
  - Citations
  - Bibliographic entries
  - Examples of common types

Planning

Why do we need a plan?

What is a plan anyway?

- A calendar schedule for completing the tasks associated to the project.
- Make it detailed: week-by-week from now until submission.
- Keep it visible: wallchart? Google Calendar? Smartphone app?

- Have a flexible plan: allow it to change, incorporate new tasks, abandon unneccessary tasks,

Most good plans focus on the tasks. What are the tasks?

- Reading
- "Doing the work"
  - Understanding new mathematics
  - Solving new problems / carrying out statistical analysis / OR analysis / mathematical modelling ...
  - Deciding how to present the materialand presenting it in different ways
- Writing
- Coding: incl. writing, debugging, testing, tidying up for presentation
- Poster preparation
- Presentation preparation
- Constructing physical models
- ...

Planning tools

- Various software tools/systems for project planning available
- Whether you need these requires some self knowledge/investigation:
  - are you naturally well organised?
  - do you find it difficult to remember and organise your schedule?
  - do you procrastinate a lot?

Some suggestions:

- a diary
- a wall planner
- Getting Things Done
- Gantt charts, Excel template
- Trello, a card based system
- ...

Tasks: Reading

- Keep it active
- Test understanding: work on exercises, fill in missing details, gaps, ...

- Make notes as you read ...
- ... these notes become your first drafts

When reading mathematics books and papers be aware the different levels of understanding you might be after, i.e.

- complete understanding of all technical details and arguments,
- simply looking for the broad outline of the topic
- just looking for nice illustrative examples
- historical background details
- ...

Tasks: "Doing the work"

- When does this happen?
  - In defined period, or throughout project?
  - Divide into smaller achievable tasks

Tasks: Writing

Your history

- How experienceed are you writing long pieces?
- How long ago was it?

The writing process

- Recognise the need for drafting & re-drafting & re-drafting ...
- Don't try and make it perfect first time.
- From now, have a draft Table of Contents and
  - use this to organise your approach,
  - use this as a menu to pick and choose writing tasks.
- You don't have to write from beginning to end.
- Writing throughout the project period allows you to
  - get technical details down while they're fresh in your mind,
  - have a break from reading.

- Introduction chapter & abstract will probably be written near submission, as
  - you can't properly introduce what isn't already there.
- Have sources of feedback
  - Your own re-reading & proofreading
  - Friends and colleagues
  - Supervisor

Tasks: Writing

A useful exercise to help writing

I have found a daily writing practice (free writing) helps my 'serious' writing. This technique was popularised by Natalie Goldberg amongst others.

- Do this regulary and ideally every day.
- Set timer for 10 minutes.
- Write constantly for these 10 minutes without stopping.
- Content, grammar, punctation, etc are not important.
- Write about mathematics, your plans for the day, reflections on yesterday, ...
- Do not stop writing. If you can't think of anything then ...

  > I am sitting here and do not know what to write. I am sitting here and do not know what to write. I am sitting here and do not know what to write. I am sitting here and do not know what to write. I am sitting here and do not know what to write. I am sitting here and do not know what to write. I am sitting here and do not know what to write. I am sitting here and do not know what to write.

This daily writing practice can be a good cure for procrastination and helps to clear the mind of distractions.

Tasks: Coding

If you plan to include computer code in your report then it needs to be ...

- well structured,
- adequately commented.

Best done as you write the code?

Tasks: Poster & presentation

- See later project talk

The plan

- Your plan will need to incorporate all the relevant tasks in a realistic way.
- Beware other coursework deadlines and make use of quieter times.

Avoid the naive plan of

- Do all the reading now ...
- ... and then do all the writing.

What are the drawbacks of this approach?

A plan which mixes the tasks we've discussed throughout the project period will provide an interesting mix of different work activities and help you to make consistent progress on all fronts.

Referencing

The purpose of referencing

Two of the main reasons are:

- To give due credit to other authors for the use of their ideas.
- To allow your reader to investigate your work further by
  - checking your claimed sources,
  - finding out more about the ideas you refer to.

In other disciplines, such as the humanities or the arts, referencing can be very important and deserves a lot of attention. In mathematics and the sciences the is less so, and as long as the above points are covered youshould be fine.

Referencing systems

There are many systems for referencing in use. They combine brief **citations** within the text which refer to full **bibliographic** information about the sources which appears in a list of references at the end of the text and/or in footnotes at the bottom of pages containing citations.

- *Numeric* reference systems are quite common in mathematics and involve a numbered list of references at the end of the text which are cited by number in the text.
  - In widespread use by many books and journals.
  - But numeric citations convey no information and require interrupting flow of reading if any information about author or age of work is required.
  - Reference lists not always sorted alphabetically by author surname.
  - Requires the use of software to implement in order to avoid manually *renumbering everything*.
- *Author Date* reference systems use **citations** consisting of author(s) surname(s) and publication year which refer to full **bibliographic** entries which are listed at the end of the text, sorted alphabetically by the (leading) author's surname.
  - Requires slightly more effort to implement than numeric systems
  - But citations now convey relevant information
  - Reduces need to interrupt flow of reading
  - Reference lists are always sorted alphabetically
  - Can be implemented manually if needed.

The Harvard Referencing style

- You are required to use the Harvard reference style.
- Fully specified in the Faculty's guide
- Pay careful attention to the specific details re ordering, punctuation, use of italics etc and apply consistently.

Further help

- Harvard Referencing guide – from MMU Library, also on Moodle.
- Advice from supervisor.
- Endnote – software for managing citations and reference lists which integrates with Microsoft Word and other software – link to MMU library help.
- LaTeX and BibTeX
  - LaTeX has a default embedded system for handling referencing using numeric citations.
  - The LaTeX `natbib` package can modify the embedded system to be author-date.

– BibTeX is a more sophisticated and flexible approach that builds a database of references.