

CMEE Masters: Miniproject Assessment

Assignment Objectives: To address on a model-fitting problem using computational methods, and produce a written report, all in a coherent, reproducible, modular workflow under version control.

Notes on Assessment :

- *The Computing component's assessment:* The assessor is playing the role of somebody trying to understand your project organization and use its workflow from scratch. So will seem like the feedback is particularly pedantic in places — please take it in the right spirit! If there were technical errors in your model fitting and selection, the points have been deducted from the Report, not Computing component's marks.
- *The Report component's assessment:* This feedback is with reference to these guidelines that were provided to you: <https://mhasoba.github.io/TheMulQuaBio/notebooks/Appendix-MiniProj.html#the-report>. In many cases, the marker would have contrasted what you have done with what you should do in your actual dissertation. *This does not mean that you were penalized* — one of the main goals of the miniproject is to provide feedback useful for your main dissertation. However, there may be cases where what you have done is just really bad practise (for example missing line numbers or abstract), irrespective of whether it is a mini- or main- project report – you will have been penalized in that case. *You can safely deduct 10-15 points from the report component mark below to get a truer picture of how much you would have obtained if this were an assessment of your final project's report (Not bad, eh?!).*
- The coursework marking criteria (included in this feedback at bottom) were used for both the computing and report components of the Miniproject Assessment. *In contrast*, Your final dissertation project marks are going to be based pretty much exclusively on the written report and viva (not code). Expect your final dissertation report to be marked more stringently, using the dissertation marking criteria: http://silwoodmasters.info/marking/criteria_and_forms.
- *Ultimately*, keep in mind that this miniproject was partly an exercise in reproducible workflow development. You may need to trade-off some computational elegance (but hopefully not reproducibility!), such as having everything run with one `run_project` command, in favor of a good written report — that's what matters most in the final dissertation assessment! In this context, the main thing to keep in mind is that one or both of your final dissertation markers will likely not be particularly quantitative or a specialist in the topic of your main project. Therefore, you will need keep the explanations simple (but not patronizingly so!). In general, this advice holds while writing papers for journals as well — keep it succinct and simple is the mantra. *Therefore, please consider the report component feedback mark separately from the computing component mark.*
- *Note that Your overall miniproject mark is the average of the two component scores. Will have the opportunity to discuss the feedback and these marks in a 1:1 meeting scheduled after this assessment has been shared with you.*
- *You will have the opportunity to discuss this written feedback in a 1:1 meeting scheduled after this assessment has been shared with you.*

Computing

All the directories were in place, no clutter.

Your `readme` structure was good. You listed key files, and gave a description of each, versions of languages used, and dependencies. You also gave instructions on installing dependencies; very good. These will need to be more general and platform-inclusive in future projects. You gave guidelines on running the project/code, but could have included what to look out for (e.g., how much time certain components might take, types of messages to expect during runtime).

The content of your `.gitignore` was OK, but why not exclude the Results directory and include in your workflow a command to create a fresh one every time the project is run?

Overall the project organization and documentation was well organised and clean – excellent job!

The Code

Running the code

The Code ran without any issues, but not with too many meaningful messages to terminal, right down to compilation of the project report - splendid!

You did not follow instructions; you are asked to write a script called `run_miniproject.sh` (or `.py`). But that's not the end of the world.

For your final dissertation, this degree of reproducibility is not expected. You may want to put your final writeup's \LaTeX source files and pdf in a separate directory (or use Overleaf, of course).

The quality of the coding

Your code was clean, with reasonable commenting throughout. You “rationalised” your code well, making good use of functions. Look at areas where you repeat (or have very similar) code as these are ripe for rationalising! In some places, your comments could be clearer / more succinct. But overall, definitely an improvement on your commenting in the early computing weeks.

Your choice of coding tools is generally appropriate. You were quite efficient in your use of packages. Not wanting to reinvent the wheel is good, but remember that relying on too many packages is not good for reproducibility, nor for the development of your coding/quantitative abilities. No complaints.

Your project ran for a reasonable duration on my computer, given the complexity of a project like this. We can discuss where you could have optimised and whether you used profiling in our 1:1 Feedback meeting. In particular, think about differences between languages (e.g. could Python have been faster for generating starting values?).

You could have put in more checks so that the computational workflow aborted if any step in the analysis gave an error (or unit tests).

You need more/better progress messages displayed on the terminal. Its a good idea to keep a user informed about the status of a project. Ideally these should be clearly delineated with special characters, such as an asterisk.

Overall, excellent work!

Marks for the project and computational workflow: 88

Report

In General

Overall, a *very* good piece of work technically! The focus on model fitting vs biology was good. You achieved very very good technical depth with your model fitting and selection analysis and interpretation. Great job going down the path of hybrid modelling. The writing needs to be improved to do justice to the technical quality of the work. Overall, you should be super proud of what you produced over a matter of few weeks. I can assure you that the majority of *final* Biology/Ecology/Evolution Masters dissertations in the UK do not even close to this technically!

Structure, language, readability

The report was reasonably well organized and easy to read. But some typos and quite a few grammatical errors.

Presentation standards

Overall, OK. The figures were in high graphics quality with nice color aesthetics, but the text within them was too small. They lacked sufficient text legends (see guidelines). Equations could have been better formatted (sizes of brackets, subscripts, appropriate usage of italics for math symbols vs operators, etc).

The Title

OK, but does not meet the guidelines. In your main project report/thesis, to the extent possible, consider using such a results-focused title — basically, the main finding(s) of the paper can be indicated in the title. Obviously, if you have a lot of findings, you can't do that. But then, it means you have too many 'storylines' / findings in your study!

Abstract

OK, not entirely meeting the guidelines. Could have been better organised (see the suggested structure in my guidelines).

Introduction

Good work laying out the background and rationale. Could have been more explicit about the motivation for your objectives, and you could/should have stated some clear questions/hypotheses. And then provided clear answers to them at the end, in the Discussion – see below (and the guidelines).

Methods

Overall good. Largely met the guidelines. Could have given an overview of the methods (the overall strategy). No mention of the starting values problem and how you tackled it (algorithmically).

Results

Good, but could have been structured into meaningful/sensible sections.

Discussion

Good. A little deeper discussion of the pros and cons of mechanistic vs phenomenological models would have been good, as well as some more biological interpretation. Should have discussed caveats and limitations more clearly, in a separate paragraph. Definitely something you should do in your main report.

Supplementary Information

None present - that's fine. **Marks for the Report component: 82**

Signed: Samraat Pawar

April 5, 2023