

School of Mathematics and Statistics
4H Single Honours Statistics Project Guidelines (STATS 4050P)
2020-2021

Intended Learning Outcomes

By the end of this course students will be able to:

- integrate the knowledge and skills they have gained from other components of their degree programme in order to carry out an extended piece of data analysis;
- describe the background to the project and the aims of the analysis;
- formulate questions of interest in appropriate technical and non-technical language;
- explain the role of statistics in answering the questions of interest;
- identify relevant statistical methodology;
- formulate an appropriate analysis plan, and update it as required;
- implement their chosen methods using statistical packages and programming as required;
- check the validity of the assumptions underpinning their chosen methods;
- interpret the results and write appropriate conclusions in technical and non-technical language;
- explain clearly the implications and limitations of the analysis;
- present the work of the project orally to an audience in a well-structured, precise and clear manner;
- present the work of the project in the form of a written report in a well-structured, precise and clear manner;
- work independently, but with the support of an experienced supervisor available as required.

Credit

Your project is worth 30 credits (25% of the 4H assessment).

Assessment

There is a generic university requirement that, in order to qualify for an Honours degree, you must attain at least a grade D3 for your project. There is no opportunity for reassessment. Your project is assessed in three ways: firstly (10%) on a peer review process in Semester 1 (see further on for details), secondly (10%) on a talk that you give (roughly 75% of the way through the project) and secondly (80%) on the report that you submit at the end of the project. Both the talk and report are marked by two markers, the talk by two members of staff different from your supervisors, the latter by one of your supervisors and another member of staff who is not your supervisor. The talk is marked by each marker, and the mean of the two markers' marks is converted to the 22-point (grade-point) scale (after the markers have tried to resolve any major discrepancies). For the report, each marker independently assesses each report on a number of qualities ("style and presentation", "quality of description", "approach" and "conclusion/interpretation": see the attached grid, which gives verbal descriptions of what is expected for a particular range of marks, and is used by the markers), each on the 22-point scale, to produce an overall mark which is a weighted average over the four qualities. If the weighted averages of the

two markers are different by at least 3 points, the two markers meet to identify what has generated the discrepancy, and to try to resolve it. If, rarely, the discrepancy remains, a third marker marks the project and the project marking team decide on the final report mark. A weighted mean of the peer review mark (10%), talk mark (10%) and the final report mark (80%) is then taken, which is rounded to the nearest integer, and converted to the alphanumeric grade point (A1, A2, etc) for the final mark.

In more general terms, what mark should you expect from your project? If you do what you are asked, and do it well, that's what is expected of an Upper Second class student; a First class student is showing considerably more initiative (as it were, taking ownership of the project), doing additional analysis well and accurately, and reporting it excellently. The Lower Second is doing what's asked, mostly correct, but not much else, and the Third is being held by the hand and still making a number of mistakes on basic techniques. All of this depends on the difficulty of the project, of course, which is reflected in the scoring. You need to do better in a straightforward project (be more imaginative, accurate and independent) than in a difficult one.

Timetable

- Register your interest if you wish to propose your own project: 4th September 2020
- Student self-proposed project proposal deadline: 16th September 2020
- Project descriptions circulated: 16th September 2020
- Students submit project preferences: by 23rd September 2020
- Project assignments to students circulated: 2nd October 2020
- Work on project starts: 5th October 2020
- Week for submission of statistical analysis plan to supervisor: w/b 12th October 2020
- Submission of initial material (e.g work from chapters 1 and 2) for peer review feedback: 23rd November 2020
- Students return peer review feedback: by 10am, 7th December 2020
- Week for submission of initial material (e.g work from chapters 1 and 2) for supervisor feedback: w/b 7th December 2020
- Week for submission of statistical methodology chapter to supervisor: w/b 11th January 2021
- Project talks begin: circa w/b 1st February 2021
- Week for submission of detailed dissertation draft to supervisor for final feedback: w/b 22nd February 2021
- Submission of project report: by noon, 19th March 2021

Workload

During the project period (Semesters 1 & 2), you are expected to work on your project, with the amount of time you spend on it in each semester dependent on how many courses you are taking. You should adjust the time appropriately, however, we suggest you spend roughly 7 hours per week in Semester 1 and 13 hours per week in Semester 2 working on your project. You should meet regularly with your supervisor(s), but use the time efficiently. Come to meetings well prepared, with questions and ideas. Independence and initiative (although not ignoring advice!) will be

reflected in your supervisor's assessment of your project. Expect about six hours of supervision across the project period. If you end up extracting more supervision from your supervisor, this may be interpreted as demonstrating a lack of independence, and impact your final mark.

Report

The length of the report (excluding title page, table of contents, bibliography, acknowledgement and any appendices) should be a maximum of 30 pages (12pt, single spaced).

Some basic ingredients of a good report are straightforward language, clear and well-annotated tables and figures, and proper referencing of books, papers, web-sites, etc., that have informed your work (so that the reader knows when you are reporting what you have done and when you are reporting what others have done).

The structure of the report is not set in stone, and you would be well advised to consult your supervisor about this, since the projects are highly diverse and will suit different approaches to reporting. The default style (Introduction, Materials and Methods, Results, Discussion and Conclusions) might suit your project well, but it might not! However if you do follow it,

1. the *Introduction* should not be too technical or jargon-filled, should be well referenced, should discuss the context of the study, its general aims and specific questions of interest;
2. the *Materials and Methods* should discuss details (not analysis) of the data (if relevant), such as the design, the variables collected and the study population, and describe the statistical methods to be used (precisely, clearly, but not at huge length);
3. the *Results* should report analysis (exploratory and formal, including simulation results in a more methodological project) with well-chosen figures and tables (think about every one "do I really need this?": if you've nothing to say about it, it probably shouldn't be there);
4. the *Discussion and Conclusions* should again avoid jargon too much, and aim to answer the questions of interest (referring back to the Results), discuss problems that remain, how your results relate to what other people have found (if relevant) and suggest further study that could be done.

Appendices can be used sparingly to show R scripts that you have produced and additional tables and figures that are interesting, but not central to the report.

There are two points at which you can submit work for detailed feedback from your supervisor(s), prior to final submission. The first round is in w/b 7th December 2020: perhaps the first two chapters of your report (e.g. Introduction, Data description and Exploratory analysis); and the second round in w/b 22nd February 2021 for an almost complete report. The nature of the work to be submitted should be agreed beforehand between you and your supervisor(s). In the second round of feedback, you will not be given additional feedback on the material you submitted in the first round. No feedback will be offered by the supervisor(s), or rereading of the report, in the last week (w/o 12th March 2021) of the project. It should be emphasized that supervisors are not here to proof-read your report for spelling, grammar and syntax. You need to deal with that yourselves!

You will be asked to submit your project electronically only (via Moodle). Please **do not** submit

a hard-copy to the School Office.

Some exemplar reports from previous sessions can be viewed on Moodle at <https://moodle.gla.ac.uk/mod/folder/view.php?id=808873>. It is worth pointing out that these reports are from several years ago and things such as the page limit may differ. Where there is a discrepancy between the report and this document, ensure you follow the guidelines outlined in this document.

Talk

You will give a short (10-12 minutes + 3 minutes for questions), assessed, talk on your project circa w/b 1st February 2021: timetabling to follow. There will be a booking sheet: you should arrange to speak at a time when at least one of your supervisors is able to attend, and you should attend as many project talks as you can (given that they will probably be scheduled in parallel sessions). You should prepare slides in, e.g., PowerPoint and these must be uploaded to Moodle by 10am on the day the first project talks will take place. In the interests of fairness, you will not be permitted to edit your slides after this point (as some talks will take place later on, after the talks have already begun). Your supervisor will be able to provide some general feedback on the slides prior to this date; the feedback will not be detailed. After the talk, your supervisor (in consultation with the talk markers) will provide some formative feedback, which may be helpful in writing the project report.

Peer Review

The peer review process not only gives you some preliminary feedback on your work, but is also an excellent chance to critically analyse and reflect on your project, by evaluating the work of other students. By taking the time to seriously assess someone else's work (based on certain criteria to follow), you develop skills and judgement that you can then use to improve upon your own work.

In Semester 1, you will be asked to write and submit a draft of the initial material of your project (e.g. Introduction, Question of interests, Exploratory analysis) for peer review. There will be a page limit of 5 pages.

Each student will then be allocated 2 documents to peer review. These reviews will be guided by 3-4 carefully directed questions, such as (but not limited to)

- Is the context of the problem well-described and clearly referenced?
- Are the scientific questions clearly identified?
- Is there a clear description of how the data were generated and what the variables are?
- Are the diagrams appropriate and the tables relevant to the questions of interest, well labeled, clear and well described?
- Is there anything missing that the reviewer would have expected?

Note that although these are yes/no questions, you are required to justify your response, with a word limit of 200 words per question. After the reviews have been provided, you will obtain the peer review feedback on your own work. You will only receive feedback on your own document if you have provided feedback for others.

You will be marked (by staff) on the feedback you give to other students during the peer review. This will be worth 5% of your total project mark. Additionally, you will be asked to reflect on the feedback you received from other students and how you incorporated what you learned during peer review (from both the process and the feedback). You will submit the reflection as a separate part of your final project submission, with a page limit of 1 page, worth 5% of your overall project mark.

Self-proposed projects

If you wish to propose your own project, you need to register your interest in doing this by getting in contact with me by the 4th September 2020. You will need to give me a rough idea of the topic, and mention whether you have already agreed upon a supervisor or are looking for one (either way is fine). The project description template (available on Moodle) will need to be filled out and submitted to me over email by the 16th September 2020. It is of the utmost importance, if you are proposing a project which makes use of a dataset, to make sure you have access to that dataset, and this needs to be available in advance of the 16th September 2020 so that it can be evaluated for suitability.

Contact

Your first port of call for help is your supervisor, although administrative queries are better directed to me.

Benn Macdonald
Benn.Macdonald@glasgow.ac.uk
31st August, 2020