MXB334: Assessment 1 Criteria

|  |  |
| --- | --- |
| Task | Modelling Task |
| Unit Learning Outcomes Addressed | 1. Expertly and critically carry out statistical analysis using statistical models in the analysis of various data sets and examples. 2. Use R to carry out statistical analyses. 3. Communicate statistical conclusions clearly and concisely both in written form and orally. |
| Due date | Week 5 |
| Weighting | 40% |
| Specifications | Individual |
| Overview | |
| This first assessment task is designed to give you the chance to apply generalised liner modelling to count data in a realistic industry scenario. It will introduce you to tools and artefacts relevant to applied statistical problems in industry. | |
| What you will do | |
| 1. Conduct an analysis into data describing workplace injuries with a view to answering a specific query. 2. Create a ‘Summary On a Page’ (SOAP), telling a story with your analysis results and communicating your conclusions. 3. Conduct your analysis using R and document your analysis using R markdown, so that the code and the analysis are held together and are reproducible. 4. Commit the analysis in stages to a github repository. | |
| What you will submit | |
| Main deliverables:   1. A statement on a page which describes your analysis and conclusions at executive level detail.    1. Should contain at least one plot that summarises your results as they relate to the original query. 2. A report describing your analysis methodology and conclusions.    1. Should be written in Rmarkdown to ensure reproducibility.    2. Should include exploratory analysis plots with commentary on contrasting or unusual aberrations.    3. Analysis should use appropriate model formulation and model checking procedures:       1. Justification of likelihood and link function selection.       2. Analysis of residuals.       3. Justification for choice of fixed or free dispersion parameter.          * Reference appendix on probability mass function of Quasi-Poisson. | |
| Resources and Useful References | |
| 1. Poisson Regression Lecture Notes 2. Cross validated and Stack Overflow websites. E.g: <http://stats.stackexchange.com/questions/66791/where-does-the-offset-go-in-poisson-negative-binomial-regression> 3. Rmarkdown documentation: <http://rmarkdown.rstudio.com/> 4. Story Telling with Data (<http://www.storytellingwithdata.com/>) <https://www.youtube.com/watch?v=X79o46W5plI> 5. Blackboard Folder for this Project. | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Task / Grade | 7 | 6 | 5 | 4 | 3 | 2-1 |
| Task 1 (Analysis): Content | Motivates analysis clearly using scenario context. Conducts exploratory analysis to identify unusual observations and relationships likely to be useful in generalised linear modelling. Assesses quality of statistical model fit and validity of model assumptions using plots and formal procedures where appropriate. Uses at least 1 formal hypothesis test for assessing model fit. States conclusions and recommendations addressing motivating queries based on evidence from modelling. Communicates uncertainty around evidence/effects during discussion of them. Identifies interesting unresolved questions that arise from analysis and makes suggestions as to further data that could be acquired to explore them. | Motivates analysis clearly using scenario context. Conducts exploratory analysis to identify relationships likely to be useful in generalised linear modelling. Assesses quality of statistical model fit and validity of model assumptions using plots and formal procedures where appropriate. Uses at least 1 formal hypothesis test for assessing model fit. States conclusions and recommendations addressing motivating queries incompletely based on evidence from modelling. Communicates uncertainty around evidence/effects at some stage. | Analysis not clearly motivated using scenario context. Conducts some exploratory analysis without explicitly stating bearing on analysis decisions. Assesses quality of statistical model fit and validity of model assumptions using plots and formal procedures. Uses at least 1 formal hypothesis test for assessing model fit. States conclusions and recommendations addressing motivating queries incompletely based on evidence from modelling. Communicates uncertainty around evidence/effects at some stage. | Analysis not clearly motivated using scenario context. Conducts some exploratory analysis without explicitly stating bearing on analysis decisions. Assesses quality of statistical model fit and validity of model assumptions only informally. Assesses model fit informally. States conclusions and recommendations addressing motivating queries incompletely based on evidence from modelling. Communicates uncertainty around evidence/effects at some stage. | Analysis not clearly motivated using scenario context. Conducts some exploratory analysis without explicitly stating bearing on analysis decisions. Fails to assesses quality of statistical model fit or assumptions in coherent way. States conclusions and recommendations addressing motivating queries without consideration to evidence from modelling. Fails to Communicate uncertainty around evidence/effects. | Analysis not clearly motivated using scenario context. No exploratory analysis. Fails to assesses quality of statistical model fit or assumptions in coherent way. States conclusions and recommendations addressing motivating queries that are incorrect. Fails to Communicate uncertainty around evidence/effects. |
| Task 1 (Analysis): Format | Analysis format is an R markdown document. All required R code to complete analysis is embedded in document in relevant places, but does not make inordinate amounts of code visible in final output. The document is inherently reproducible, it can be knitted to html in a clean R environment without errors or warnings. Evidence of author taking advantage of github version control, making frequent incremental pushes to assignment repository. | Analysis format is an R markdown document. All required R code to complete analysis is embedded in document but placement may make it difficult to locate. Does not make inordinate amounts of code visible in final output. The document is inherently reproducible, it can be knitted to html in a clean R environment without errors. Task is submitted on github repository. | Analysis format is an R markdown document. Some R code required to complete analysis is missing. Some R code blocks or output disrupt flow of commentary in final output. The document is inherently reproducible, it can be knitted to html in a clean R environment without errors. Task is submitted on github repository. | Analysis format is an R markdown document. Some R code required to complete analysis is missing. Many R code blocks or output disrupt flow of commentary in final output. The document is not inherently reproducible, it cannot be knitted to html in a clean R environment without fixing errors. Task is submitted on github repository. | Some R code required to complete analysis is missing. Many R code blocks or output disrupt flow of commentary in final output. The document is not inherently reproducible. it either cannot be knitted to html in a clean R environment or is not an R markdown document. Task is submitted on github repository. | R code required to complete analysis is missing or in a separate file. The document is not inherently reproducible. it either cannot be knitted to html in a clean R environment or is not an R markdown document. Task is submitted on github repository. |
| Task 1, Subtask 1 (Appendix) | Clearly shows how the quasi-poison probability mass function can be obtained from the canonical exponential family form of the poisson using a series of equations written in LaTex style code embedded in Rmarkdown output. | Clearly shows how the quasi-poison probability mass function can be obtained from the canonical exponential family form of the poisson using a series of equations embedded in Rmarkdown output. | Shows how the quasi-poison probability mass function can be obtained from the canonical exponential family form of the poisson using a series of equations embedded in Rmarkdown output. Skips some steps such that derivation is unclear or requires large mental leaps. | Gives the quasi-poison probability mass function embedded in Rmarkdown output. | Gives the quasi-poison probability mass function in a separate document to R markdown output. | Does not provide the quasi-poison probability mass function. |
| Task 2 (SOAP): visualisation | Clear evidence in design of visualisations with intent to communicate information relevant to queries driving analysis. The design is engaging and transmits information in easy to understand way. The design uses appropriate axes and legends. | Clear evidence in design of visualisations with intent to communicate information relevant to query driving analysis. The design is engaging and transmits information in easy to understand way. The design attempts to use appropriate axes and legends, however some minor flaws with colours, labels, or scales makes the overall visualisation harder to understand at first sight. | The information that visual elements are intending to communicate is not evident at first sight. The design is apparently engaging however does not transmit information in easy to understand way (might confuse the reader). The design attempts to use appropriate axes and legends, however some minor flaws with colours, labels, or scales make the overall visualisation harder to understand at first sight. | The visualisation chosen is not appropriate for the combination of audience and information. The design is not engaging and does not transmit information in an easy to understand way. The design attempts to use appropriate axes and legend, however some evident flaws with colours and/ or labels and /or scales make the overall visualisation harder to understand. The visualisation is technically correct and uses correctly selected data, however assumes too much knowledge to interpret the visualisation correctly. | The visualisation chosen is not appropriate for the combination of audience and information. The visualisation is misleading and confusing. The visualisation does not use appropriate axes and legends. | No evidence of design in considering audience or information. The visualisation is misleading and confusing. The visualisation does not use appropriate axes and legends. The visualisation is technically incorrect. |
| Task 2 (SOAP): Communicating Conclusions | Actionable recommendations are made that address the queries driving analysis. Recommendations are linked to evidence from analysis. The uncertainty around evidence/effects is addressed in a clear way through both visualisation and description. Caveats or debatable assumptions from analysis are stated. Level of technical detail and volume of content is appropriate for CEO level (Non-technical decision maker with limited attention span). | Actionable recommendations are made that address the queries driving analysis. Recommendations are linked to evidence from analysis, but that link may be unclear at first sight. The uncertainty around evidence/effects is addressed though it may be difficult to interpret. Caveats or debatable assumptions from analysis are stated. Level of technical detail and volume of content may be slightly inappropriate for CEO level (Non-technical decision maker with limited attention span). | Actionable recommendations are made that address the queries driving analysis. Recommendations are presented alongside evidence from analysis, with links to be drawn by reader. The uncertainty around evidence/effects is addressed though it may be difficult to interpret. A caveat or debatable assumption from analysis is not stated. Level of technical detail and volume of content may be slightly inappropriate for CEO level (Non-technical decision maker with limited attention span). | Actionable recommendations are made that do not fully address the queries driving analysis. Recommendations are presented alongside evidence from analysis, with links to be drawn by reader. The uncertainty around evidence/effects is not addressed. A caveat or debatable assumption from analysis is not stated. Level of technical detail and volume of content is inappropriate for CEO level (Non-technical decision maker with limited attention span). | Actionable recommendations are made that do not fully address the queries driving analysis. Some recommendations are presented without supporting evidence. The uncertainty around evidence/effects is not addressed. A caveat or debatable assumption from analysis is not stated. Level of technical detail and volume of content is inappropriate for CEO level (Non-technical decision maker with limited attention span). | Actionable recommendations are not made or do not address the queries driving analysis. Recommendations are presented without supporting evidence. The uncertainty around evidence/effects is not addressed. Caveats or debatable assumptions from analysis is not stated. Level of technical detail and volume of content is inappropriate for CEO level (Non-technical decision maker with limited attention span). |

# Assessment supplementary information

## Extensions

Requests for extensions need to be submitted before the assessment item due date to SEF Student Services.  If you can't apply by this date due to circumstances beyond your control, contact  [SEF Student Services](https://www.student.qut.edu.au/about/contact/groups/faculty-student-offices)  to discuss your options. You need to provide supporting documentation to verify your special circumstances claim and to show how the circumstances impact your ability to submit the assignment by the due date. Examples of special circumstances that warrant an extension, and those that do not, can be found on Student Gateway: <https://www.student.qut.edu.au/studying/special-circumstances>

## Late submission of assessment item

If you submit an assessment item after the due date without an approved extension (or after the extended date where an extension has been granted) your work will not be marked and will be awarded a grade of 1, or 0%.

If special circumstances prevent you from meeting the assessment due date, you can apply for an extension (see above). If you don’t have an approved extension you should submit the work you have completed by the due date and it will be marked against the assessment criteria.

QUT’s assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines. Further information is available on Student Gateway <https://www.student.qut.edu.au/studying/assessment/late-assignments-and-extensions>

## Remarking of your assessment item(s)

QUT has mechanisms in place to ensure that all assessment pieces are marked consistently and fairly. During the semester or teaching period you should discuss your progress in all course work with teaching staff. You can expect a clear indication of whether you have achieved the objectives set for each assessment item. Accordingly, no individual piece of assessment will be remarked during the semester.

At the end of semester, please check your overall mark and if you are not satisfied with your final grade, you can contact relevant teaching staff to clarify the reason for your grade and if you remain dissatisfied after discussion with teaching staff, you can apply for a formal review of grade within ten working days. Further information is available on Student Gateway: <https://www.student.qut.edu.au/studying/assessment/reviews-and-appeals/review-of-grade-or-academic-ruling>