# Group ID - MSc in Data Analytics

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## Abstract

*This research delves into a comprehensive analysis of Ireland's population estimates from 1950 to 2023, with a focus on age groups and genders. Utilizing Python, the study conducted data preprocessing, eliminating irrelevant information and addressing missing values. Visualizations of age structures across all years were created, accompanied by a flexible function for generating population pyramids. The study further explored mean age variations over time, employing machine learning to predict changes. Clustering techniques identified baby booms, and predictive models calculated populations for specific ages. Statistical analyses compared the data against normal, binomial, and Poisson distributions, offering insights into the underlying population dynamics.*

## Introduction

Format your submission using the following styles as a guide. If you are completing your report for a specific assignment, make sure you follow any formatting guidelines provided by your supervisor, lecturer or tutor.

### Normal Text

In general, use a 12-point Times New Roman font, or other Roman font with serifs.

### Title and Authors

The title (Arial 14-point bold) runs across the full width of the page and is centred. Authors' names (Arial 12 point not-bold) and affiliations (Arial 12-point not-bold) are entered into the table at the top. We also recommend you add your postal address and e-mail address using the same style as for authors.

### Abstract and Keywords

Every submission should begin with an abstract of about 100 words in the normal text style but italicized. The abstract should be a concise statement of the problem, approach, findings, and conclusions of the work described. Keywords will be taken from your submission form and added when the publication is assembled.

### References and Citations

In the body of the text, cite the references like so (author, year).Use the standard Harvard format for listing references at the end of your report. You can refer to the reference list at the end of this document as an example.

### Page Numbers and Footnotes

Make sure you number pages unless explicitly asked not to. (For example, many journals request that page numbers are *not* used in submission for publication.) In general, avoid the use of footnotes. Stick to using references and citations.

## Sections

Breaking your report into sections can make it much easier to read. Main sections (Introduction, Materials and Methods, Results and Discussion/Conclusions should generally be in Arial 12-point bold title-case or follow specific instructions given with your real assignments.The use of screen shots or diagrams to enhance your explanations is encouraged.

### Subsections

Arial 12-point title-case.

#### Sub-subsection headings

Arial 12-point italic.

## Figures

Use Normal Times New Roman 12-point font for figure captions.

## Writing Style

* Use a simple writing style – if five words convey your meaning don’t use ten.
* Make use of headings and sub-headings to break the text and your key ideas into readable sections.
* Use past tense apart from descriptions about existing knowledge and results when you should use the present tense.
* Be specific about observations and quantities.
  + Avoid the use of adverbs (quickly, rapidly, slowly).
  + If a word you are using ends in 'ly' the chances are you can provide a measurement instead (over five minutes *instead of* slowly).
  + Be careful with adjectives which refer to quantities (few, lots, many).
  + Provide actual amounts (three Mayflies *instead of* a few Mayflies).
* Always back up your assertions with data or logical argument and references.
* Use a spell checker or dictionary before you print out or submit your final report.
* If you are unsure about grammar ask a friend or someone who is good at writing to read through your draft report.
* Do not use derogatory language and be careful and considerate if you criticise the work of others. Stick to the arguments and facts.

## Acknowledgements

The idea and parts of the formatting for this template came from the Association for Learning Technology (UK) ALT-C 2004 Research Paper Format Template.

## References

Knisely, K. 2005, *A Student Handbook for Writing in Biology*, 2nd Edition, Smauer Freeman.

Pechenik, J. A. 1997, *A Short Guide to Writing about Biology*, 3rd Edition, Addison-Wesley.

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Harvard Style *UseIt,* Available at http://www.library.uq.edu.au/training/citation/harvard.html