# **Guide for writing technical reports**

# Introduction

The purpose of this document is to provide you guidance on how to structure analytical reports. We will use this document while we are grading reports. However, I hope you can use the guidance provided in the future for other classes and in your career when you are writing reports especially in Business Analytics and Data Science.

The main challenge in writing technical reports is to communicate complex information effectively to a wide audience with different backgrounds. In order to facilitate this you should break your report into sections and provide different levels of technical information in each section. I will provide a framework below.

# Purpose of a report

Every report has a purpose beyond the simple presentation of information. Some common purposes are:

* To convince the reader of something. For example:
  + to convince a government agency of the effect of a particular course of action
  + to convince a client that your solution will fulfill their needs
  + to convince the public that a proposed project will bring benefits
* To persuade the reader to do something. For example:
  + to persuade a government or council to adopt a particular course of action
  + to persuade a client to choose one design over another
  + to persuade an organisation to partner with your company on a project
* To inform the reader about something (usually for a further purpose). For example:
  + to provide a government department with information they will base policy on
  + to instruct other engineers who will work from your plans
  + to present the outcomes of a project to stakeholders

When planning an assignment report, your first step is to clarify its purpose; that is, what you want it to achieve.

# Audience

The next crucial thing you need to determine is who is the intended audience of your report (and same for presentations.) Think about the background of the people who will read your report and their training in the tools you have used in your analysis. If you are making a case for a change or an action in business, your report will be almost certainly read by people with little training in advanced analytics and data science tools. You should always bear this in mind.

For the purpose of the assignments in this class your report should be mainly written for your immediate manager who is well experienced on the subject and has some experience in applying quantitative models. However, they could use your report to communicate with upper management, who is less familiar with quantitative methods. This means parts of your report should summarize your findings without resorting to technical jargon as explained below.

# Details of a technical report

Your report should have the following sections.

## Title (less than 60 characters)

## Summary or abstract (less than 250 words)

The Summary is usually written last of all. It provides a brief overview of the substance of the report. It is a stand-alone document generally used by busy managers who might not have time to read the full report. That’s why it is usually referred to as the Executive Summary in the workplace.

The Summary is not an introduction to the topic. It should focus on what you did, how you did it, and the main outcomes and significance of your work. The Summary:

* states the topic of the report
* briefly outlines your approach to the task (if applicable)
* focuses on the results or outcome of the project, the findings of your investigation: or the key aspects of your design
* states the significance or implications of the results.

The Summary does NOT:

* provide background information on the topic
* explain the motivation for the project
* refer to figures, tables or references contained in the report.
* use technical jargon without introducing it briefly

## Introduction

The Introduction tells the reader what the report is about. It sets the project in its wider context and provides the background information the reader needs to understand the report. The Introduction:

* introduces the topic of the report in context,
* explains the problem and/or motivation for the project,
* states the aim/s of the project,
* explain the details of the data used,
* indicates the purpose of the report and briefly outlines the report structure.

## Body of the report

The Introduction and Conclusions act as a frame for the body of the report, which is where you present your own work. In the body of the report the information should be organised so that the reader can follow the development of your project. You will therefore need to put some thought into ordering the sections and choosing concise but informative headings and subheadings. Use subsections to explain different steps in your analysis and make sure you answer all the questions stated in the case.

The body of the report:

* presents the information from your research, both real world and theoretical, or your design
* organises information logically under appropriate headings
* conveys information in the most effective way for communication by means of:
  + - * figures and tables
      * bulleted or numbered lists
      * formatting to break up large slabs of text.

## Extensions

Use the same structure as body of the report and make sure to

* + 1. Answer additional questions
    2. Thinks you might want to add to your model going forward.

## Conclusions and recommendations

The Conclusions and Recommendations may be combined or, in long reports, presented in separate sections. If there are no recommendations to be made as a result of the project, just call this section Conclusions.

The Conclusions section sums up the key points of your discussion, the essential features of your design, or the significant outcomes of your investigation. As its function is to round off the story of your project, it should:

* be written to relate directly to the aims of the project as stated in the Introduction
* indicate the extent to which the aims have been achieved
* summarise the key findings, outcomes or information in your report
* acknowledge limitations and make recommendations for future work (where applicable)
* highlight the significance or usefulness of your work.

The conclusions should relate to the aims of the work

## References and appendices

Appendices contain material that is too detailed to include in the main report, such as long mathematical derivations or calculations, detailed technical drawings, or tables of raw data. The content should be summarised and referred to at the appropriate point in the body of the report. The conventions for appendices are as follows:

* each appendix must be labelled with a number (or letter) and title
* the appendix numbers and titles must be listed on the Contents page under the heading Appendices (if more than one) or Appendix (if only one)
* each appendix must be referred to by number (or letter) at the relevant point in the text.

# Additional references

If you are not familiar with writing technical reports and you need more direction than the one provided above, please check the following references.

* [Writing an engineering technical report](https://www.monash.edu/rlo/assignment-samples/engineering/eng-writing-technical-reports)
* [Guide to technical report writing](http://www.sussex.ac.uk/ei/internal/forstudents/engineeringdesign/studyguides/techreportwriting)
* [Another guide to writing a technical report](https://www.aresearchguide.com/writing-a-technical-report.html)