1 Report Structure

1.1 Cover Page

1. University's Logo.
2. Faculty and Department.
3. Course number and name (e.g., "ENCS5141—Intelligent Systems Laboratory").
4. Report title (e.g., "Case Study #1—Data Cleaning and Feature Engineering for the Titanic Dataset").
5. Student's name and ID.
6. Instructor's name.
7. Assistant's name (optional).
8. Date of submission.

1.2 Abstract

This is usually written after finishing the report, as you'll have a better understanding of what needs to be written here.

1. Aim: What is the objective of the study (e.g., "The study investigates the performance of binary and linear search algorithms?")?
2. Method: The scientific method used to conduct the study (e.g., "The execution time of each algorithm is measured on three sorted arrays with relatively different sizes.").
3. Results and Conclusion: What are the key results and conclusions of the study (e.g., "As the array size increases, binary search becomes significantly faster than linear search. However, for very small arrays (i.e., less than 10 elements), linear search proved to be faster.")? It is possible to provide numbers here if the numbers are considered as key results. Such as the accuracy of a specific model on the testing set of a specific dataset.

1.3 Introduction

This section contains three main parts, usually presented in the following order:

1. **Motivation**: This part (paragraph) focus on the motivation of the experiment and the importance of the phenomenon that's being experimented.

2. **Background**: This part provides a breif theoretical background for the topic of the study/experiment.
3. **Objective**: This part mentions the aim of the study. It could be in form of the scientific questions (research questions) which should be answered by this study.

1.4 Procedure and Discussion

Describe the steps that have been taken to produce the results. This section should allow the reader to reproduce the results. Some results in this lab are not guaranteed to be reproduced due to the existence of randomness in modules like training algorithms. However, that error should be negligible given that experiments usually include multiple trials.

In this section, detailed code listings are not allowed. You should attach the complete code as a separate file (usually Jupyter Notebook in this lab). However, unusual parts of the code need to be provided here in the most compact way.

Make sure to provide the results of the experiments conducted. Results should be provided in tables that include all the information required to understand them. This means that the table should contain an appropriate caption and descriptive headers and units.

You can highlight specific results (or a different view of the results) in extra tables or plots. Remember that the intention of the report is to communicate your results with others, so make sure to use tables and plots that allow for effective communication. Meaning that the plots and figures should make it easier for the reader to understand the report.

You should then discuss the results based on the purpose and scientific questions of the assignment. For example, if we're to test the time complexity of binary and linear search, we need to compare the measured execution time, and we should discuss how changing the number of elements in the array affected the relative execution time of both algorithms. Two important notes on the discussion:

1. You should address all scientific questions in the assignments; usually you'd be asked in the assignment description for these things (e.g., "Compare the execution time of both linear and binary search algorithms on arrays with different sizes.").
2. You shouldn't mention any unsubstantiated claims. Every sentence discussed here should be a conclusion from the experiment results. For example, it's unacceptable to say, "The recursive implementation of binary search requires more stack space than linear search." as it's not something that you've tested in your experiments.

1.5 Conclusion

Here, you should try to answer every scientific question in your assignment based on the results and the discussion that you've provided in the previous sections. You should also try to compare the actual results with the theoretical facts to see if your experiment proves or does not prove these facts.

The reader should be able to check the conclusion to see if you've addressed all the assignment requirements effectively or not.

If the results contradict the theoretical facts, then you should try to provide assumptions on the reason, and you should explain how they can be proven as part of the future work.

2 Report Styling

1. Report pages should be borderless. You shouldn't add any border to the page style.
2. Use single line spacing. It should be the default in Microsoft Word or LaTeX.
3. Use the Computer Modern (CMU) font family: CMU Serif for the text, and CMU Typewriter for the code. Alternatively, you can use Time New Roman for the text and Courier New for the code.
4. Caption placement should be above the table and below the figure and the listing.
5. Figures tables, and code listings, should be centered. In case of subfigures, the outer figure should be centered while the inner subfigures should be evenly spaced.
6. Figures, table, and code listings, should be numbered with sections' prefix (e.g., Table 3.4 is the 4th table in the 3rd section of the report).