Generic Outline for Data Analysis Report

0. Front Material

   - Title: Project title, your name, and date
   - Executive Summary (like an abstract): One paragraph that describes the problem, how it is addressed, results, and conclusions.

1. Introduction

   - Background: clear, concise statement of scientific problem and context into which investigation fits.
   - Problem: Specific questions to be answered or hypotheses to test.

2. Methods (this section should be brief)

   - Population from which data were drawn; definition of sampling units.
   - Criteria for inclusion or exclusion of specific units from study or analysis.
   - Data collection; experimental design where appropriate.
   - Methods of statistical analysis; software.

3. Results

   a. Exploratory Data Analysis (EDA; 90% of results should be obvious 90% of the time through presentation of simple descriptive statistics and plots.)
      - Visualizations: histograms, box-plots/violin plots, scatter plots with smooths
      - Summary statistics: means/medians, standard deviations, min/max/range
      - Tabular summaries: two- and three-way cross-classifications
      - Measures of association: correlation coefficients, odds ratios

   b. Model Fitting/Inferences
      - Regression coefficients with standard errors or confidence intervals with appropriate units of measure
      - Transformation back to original or most meaningful scale of measurement
      - ANOVA: fraction of variation in response that is explained by different covariates
      - Alternative models and explanations: rationale for variables selected into final model(s)
      - Tests of hypotheses/p-values
      - Model checking: diagnostics designed for specific model assumptions; stability, influence, and outliers
      - Interpretation!

4. Discussion/Conclusions

   - What is the answer to the question(s) of interest?
   - Conclusions to be derived from the analysis.
   - Limitations of the study design, data, and analysis and how they may affect the conclusions.
   - Interpretation of the results in a scientific context.
   - Importance of the findings; new questions that may have arisen for investigation.