Emissions Case Study - Rubric

DS 4002 - Fall 2023 - Professor Alonzi
Due: see canvas
Submission format: GitHub repository link

Individual Assignment

General Description: Submit to canvas assignments a link to your GitHub repository for this project.

Preparatory Assignments: In-Class sessions and lectures, group projects, CS1 iteration 1 & 2.

Why am I doing this? The goal of this assignment is to perform the analysis to achieve the goals laid out in the hook document. In a world grappling with the urgent need for sustainable develo9pment, environmental concerns take center stage. Governments, industries, and individuals are increasingly recognizing the impact of greenhouse gas emissions on climate change. As a data scientist, students are tasked with the mission of forecasting and informed decision-making to promote sustainable practices globally.

Scenario: Our World in Data sources greenhouse gas data from countries around the world. This data set can best be used to effectively predict future greenhouse gas emissions, as it includes data from the past two centuries. The motivation behind this study is to empower policymakers, environmentalists, and businesses with accurate insights into emission trends. The hope is to contribute to a global effort in mitigating climate change and promoting a more sustainable future.

Main Objective: To develop a robust predictive model that accurately forecasts greenhouse gas emissions for each country. This model will be a comprehensive tool that allows interested parties to assess the environmental impact of different countries overall, identify key contributors to emissions, and formulate targeted strategies for reduction.

What am I going to do?
You'll be responsible for guiding your own efforts through various project components. Efficiency is key in breaking down tasks. You will be personally responsible for specific aspects of the project. For instance, you may delve into crafting the analysis code or take charge of managing data and documentation within the GitHub repository.

Key Responsibilities and Goals:

- Personally ensure the efficient and accurate development of the analysis code based on the research plan.
- Independently organize and manage project data and documentation effectively within the GitHub repository.
- In addition to executing tasks, you will actively participate in maintaining your focus and progress. Identify key insights or elements crucial for the upcoming presentation, taking personal ownership of the project's direction.

Challenges and Decision-Making: The primary challenge is recognizing when the research plan's goal is achieved and deciding when to transition to preparing presentation materials. Keep the overarching goal in mind, making decisions that align with maintaining your personal focus on achieving that goal.

Tips for success:

- Clearly Define Objectives and Research Questions: Start by clearly outlining the objectives of your case study. What specific information or insights are you seeking to uncover? Formulate precise research questions that will guide your analysis. This clarity will help you stay focused and efficient throughout the project.
- Focus, focus, focus – Research shows that if you are programming and you have a distraction it takes you 20 minutes to get your head back into the state it was in prior to the start of the distraction. Find a way to block out your time and your mind and you can get quite a lot in done in a short focused window.
- Thorough Data Collection and Organization: Ensure comprehensive and accurate data collection. Depending on your case study, data may come from interviews, surveys, documents, or other sources. Organize the data systematically, using tools such as spreadsheets or databases. Properly label and document each piece of information to avoid confusion during analysis.
- Create Compelling and Insightful Visualizations: Communicate your findings effectively through visualizations. Create clear and informative charts, graphs, and diagrams to present key trends and insights. Visualization not only aids in conveying complex information but also makes it easier for stakeholders to grasp the significance of your analysis

How will I know I have Succeeded? You will meet expectations on the Emissions Case Study when you follow the criteria in the rubric below.

Spec Category	Spec Details
Formatting	• One Github Repository (submitted via link on Canvas) ○ Include new sources if applicable

README.md	• Goal: This file serves as an orientation to everyone who comes to your repository, it should enable them to get their bearings.
	• Use markdown headers to divide content
	• Make an H2 (##) section explaining the contents of the repository
	• SRC section
	  ○ Make an H3 section for Installing/Building your code
	  ○ Make an H3 section for Usage of your code
	• DATA section
	  ○ (This one is tricky. Your data may (or not) fit in repo)
	  ○ Data Dictionary (use markdown table formatting)
	  ○ Data Files or Link to data if it doesn't fit on github
	  ○ Relevant notes about use of data
	• FIGURES section
	  ○ This will be in progress when MI3 is complete and finished during MI4

	○ Table of contents describing all figures produced and summarizing their takeaways ○ Use markdown table formatting • REFERENCES section ○ All references should be listed at the end of the Readme.md file (Use IEEE Documentation style (link)) ○ Include any acknowledgements ○ Include (by link) your MI1 and MI2 assignments
LICENSE.md	• Goal: This file explains to a visitor the terms under which they may use and cite your repository. • Select an appropriate license from the GitHub options list on repository creation. • Usually, the MIT license is appropriate.
SRC folder	• Goal: This folder contains all the source code for your project. • Include all code files you produce • The high-level documentation for this code lives in the main level README.md file. • Include supplemental documentation as necessary, especially if it is too detailed/verbose for the overall readme.
DATA folder	• Goal: This folder contains all of the data for this project • If your data fits in GitHub place all of it here • If your data does not fit in GitHub use a single file explaining the process to obtain the dataset.
Figures folder	• Goal: This folder contains all of the figures generated by your project • This will be in progress when MI3 is complete and finished during MI4 • If you are going to use a figure in your presentation place it here • Include with every figure relevant notes about the figure
References	• All references should be listed at the end of the document • Use IEEE Documentation style (link)

Acknowledgements: Special thanks to Professor Alonzi for the template as well as Jess Taggart from UVA CTE for coaching on making this rubric. This structure is pulled directly from Streifer & Palmer (2020) and modified to match the case study's needs.