CS – IPCC Predictions Rubric

Fall 2023 - Audrey Himes
Due: December 2023
Submission format: Upload link to github repository to canvas

Individual Assignment

General Description: Submit to canvas a link to your case study repository.

Preparatory Assignments – Class sessions about case study reading. Class sessions about time series analysis.

Why am I doing this? As a data scientist, it is important to remember to be critical of other people's work and figures that you see. Everyday, we are exposed to countless facts and figures. Rather than just accepting these as sound, we should be skeptical and do due diligence to confirm the information that we take in. This is a real-world example where you can apply what you have learned about time series data and model-building towards fact-checking. Rather than be focused on the concrete predictions that a time-series model may be able to produce, you should be able to synthesize quantitative data with qualitative analysis and scrutiny. As you learn to evaluate results and engage in your own critical thinking, you will become a better data scientist.

- Course Learning Objective: critical thinking
- Course Learning Objective: synthesizing results
- Course Learning Objecting: communicating findings

What am I going to do? In this repository, you are given various resources that describe time series model-building and provide background to the IPCC reports around which this question is framed. After reviewing the information, you will be responsible for the deliverables that are detailed at the bottom of the Hook Document. In order to produce these deliverables and understand the assignment, you will need to step through the code that has been attached. Extracting those initial results will allow you to engage in critical thinking about how the IPCC may have arrived at their predictions and compare those results to the initial results from the model. If you choose to extend to the challenge part of the assignment, you can apply the original model to make predictions that go beyond the given data (for 2016-2099). With these results, you can then further your comparison and analysis to the work of the IPCC. Throughout this entire assignment, there is not necessarily a 'correct' reasoning as to why there may be differences in the predictions of the model and those of the IPCC. Rather, you are tasked with thinking deeply and providing sound justification for any line of logic that you choose to engage with.

Tips for success:

- Don't be afraid to do your own research. While there are quite a few resources that should help you understand the code and the IPCC documentation, feel free to take this further and seek out creative solutions.

- Be confident in your skills. Even if you don't think you are the best at coding, you are well-equipped to interpret results and think deeply about a problem.
- Don't overcomplicate it. This prompt is *not* asking you to solve climate change. Rather, you should be able to think about how the IPCC may be arriving at their predictions and where there could be a disconnect between the model that is provided for you and the one that the IPCC has used for forecasting.

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

Formatting	● Repository – A new Github repository containing all materials ○ Create a new Github repo for this assignment containing ▪ README.md ▪ Basic Assignment Graph ▪ Basic Assignment Document ▪ Challenge Assignment Graph ▪ Challenge Assignment Document ▪ Supplemental Code + Resources
README.md	● Goal: This file provides an overview of each file in the repository ● Structure this file similar to that of an executive summary ● Give a brief outline of what is contained in each document included in the repository ● If you have any supplemental resources, include a title and link to each source at the bottom of the file
Basic Assignment Graph	● Goal: Demonstrate a proper walk-through of the provided code ● This graph should show the surface temperature predictions that the time series model produces from 1850-2015. ● Format: PDF or jpeg
Basic Assignment Document	● Goal: Display your critical thinking skills as they apply towards the prompt. ● Describe any differences between the surface temperatures from 1850-2015 that the model predicts and the temperatures given in the provided data from Berkeley Earth and the findings detailed in the resources from the IPCC. ● Give reasons why there may be discrepancies between all of these values. Do not be afraid to criticize the model that has been provided and where it may fall short of the IPCC. ● Two or three paragraphs ● Format: PDF document
Challenge Assignment Graph	● Goal: Demonstrate an extended understanding of the time-series model

	● This graph should show the surface temperature predictions that the time series model produces from 2016-2099. ● This portion of the assignment is optional, although encouraged to demonstrate that you are willing to take on a new challenge ● Format: PDF or jpeg
Challenge Assignment Document	● Goal: Display your critical thinking skills and creative reasoning abilities. ● Describe any differences between the surface temperatures from 2016-2099 that your model predicts and the findings detailed in the A2 IPCC Scenario. ● Give reasons why there may be discrepancies between all of these values. Do not be afraid to criticize the model that has been provided and where it may fall short of the IPCC. Think about what each model could be including or lacking. ● One or two paragraphs ● Format: PDF document
Supplemental Code + Resources	● Goal: Include any or all additional documents that you used to produce the above deliverables ● This could include extra resources and code ● Format: Code file + PDF documents (additional resources)

Acknowledgements: Special thanks to Jess Taggart from UVA CTE for coaching on making this rubric. This structure is pulled direction from Streifer & Palmer (2020).