

# CS3 Rubric - Forecasting Life Expectancy Case Study

**DS4002 - Spring 2025 - William Mitchell**

**Due: Assigned Date**

**Submission Format:** A link to a GitHub repo to be uploaded to Canvas with all relevant materials.

## **Individual Assignment**

Preparatory Assignments - Prior Data Science assignments throughout the semester, and any relevant time-series data work.

**Why am I doing this?** This is your opportunity to create solutions to challenging issues that we face today through the use of time-series analysis. Through the use of data science, you will be able to forecast and explore results that can have a major impact.

- Course Learning Objective: prepare findings for your presentation to your peers.

**What am I going to do?** You will be completing a time-series forecasting project focused on predicting life expectancy trends based on various economic and healthcare-related factors using the data provided. You will be using ARIMA as the baseline model to predict life expectancy based on past life expectancy data. Then, you will be using Facebook Prophet models to predict future trends in life expectancy with external regressors incorporated. The deliverables for this project include:

- GitHub repository with all relevant scripts and results uploaded
- Graphs and tables that were created through analysis with clear titles/headers/keys/legends for interpretation
- One page summary of findings in PDF format

All of this will be submitted electronically via a link to a GitHub repository.

## **Tips for success:**

- Make sure to use required python libraries:
  - Pandas
  - Matplotlib
  - Statsmodels
  - Scikit-learn
  - Prophet
- Make sure to install all required dependencies, run:
  - 'Pip install -r requirements.txt'
- Don't be afraid to take risks! You can complete this assignment by being determined and challenging yourself.

**How will I know I have succeeded?** You will meet the expectations on CS3: Forecasting Life Expectancy Case Study when you follow the criteria in the rubric below.

Spec Category	Spec Details
Formatting	<ul style="list-style-type: none"> <li>Repository - A GitHub repo (and cloud storage folder if necessary) containing all materials <ul style="list-style-type: none"> <li>Submit a link to the repo</li> <li>Everything is contained in the repo or linked to it if appropriate</li> <li>Contents <ul style="list-style-type: none"> <li>Scripts with all relevant code in a folder entitled 'Scripts'</li> <li>Graphics and tables created through analysis in a folder entitled 'Output'</li> <li>A one page summary of findings in a folder entitled 'Results'</li> <li>A license file containing a MIT license uploaded to the repository</li> <li>A README file containing a description of the project, steps for reproduction, and relevant references, which should be appended in IEEE citation format</li> </ul> </li> <li>Use PDF format when possible</li> <li>For code and data products use the appropriate format for whatever it is</li> </ul> </li> </ul>
Scripts	<ul style="list-style-type: none"> <li>All relevant code and analysis is to be included in a folder titled 'Scripts' <ul style="list-style-type: none"> <li>Contents <ul style="list-style-type: none"> <li>Preprocessing files, data cleaning, and EDA for datasets</li> <li>Scripts for tuning ARIMA and Prophet models</li> <li>Relevant code for production of output (graphics and tables)</li> </ul> </li> </ul> </li> </ul>
Output	<ul style="list-style-type: none"> <li>Graphics and tables created through analysis should be placed in a folder titled 'Output' <ul style="list-style-type: none"> <li>Ensure that all files have accurately labeled titles, legends, keys, and headers for easy interpretation.</li> </ul> </li> </ul>
Results	<ul style="list-style-type: none"> <li>Summary of Findings - A one page PDF document summarizing findings and including the most relevant graphics and tables created through analysis. To be uploaded to the repository in the 'Results' folder <ul style="list-style-type: none"> <li>Use IEEE citation format for references</li> </ul> </li> </ul>
References	<ul style="list-style-type: none"> <li>Append references to the README in IEEE citation format</li> </ul>

Acknowledgements: Special thanks to Jess Taggart from UVA CTE for coaching on making this rubric, and Professor Alonzi and Ethan Wang for their help this semester. This structure is pulled from [Streifer & Palmer \(2020\)](#).