

## U.S. Mortgage Rates Case Study Rubric

DS 4002 – Fall 2024 - Instructor: Loreto Alonzi

Due: December 9, 2024

Submission format: GitHub repository (submitted by link to Canvas)

### Individual Assignment

**General Description:** Submit to Canvas a link to your GitHub repository for this project

**Why am I doing this?** The goal of this assignment is to analyze historical trends in U.S. mortgage interest rates and predict their trajectory for the next decade. This project will help you develop practical skills in analyzing real-world financial data, understanding long-term trends, and presenting insights that could influence critical decision-making. By completing this work, you'll not only deepen your understanding of time-series analysis but also address a pressing societal issue: the challenges of homeownership and its implications for the future.

As with all assignments in this course, the focus is on learning and applying data science techniques to a real-world context. This is an opportunity to enhance your analytical abilities and refine your professional communication skills.

- Learning Objective: Translate data science concepts and methods into actionable insights using real-world datasets and communicate findings effectively to a target audience.

**What am I going to do?** You will examine 50+ years of U.S. mortgage interest rate data, identify key trends, and provide a forecast for the next decade. Your work will involve exploring historical patterns, uncovering insights, and delivering a high-level summary that addresses the challenges faced by future homeowners. While the final deliverable will be specified in the rubric, the goal is to synthesize your analysis into a clear and engaging narrative.

### Your final deliverable should include:

- Insights into U.S. mortgage rate trends.
- Clear, professional visuals of mortgage forecasts.
- Discussion of findings, forecast reliability, and practical applications.
- A complete repository with code, outputs, and all components outlined in rubric.

### Tips for success:

- Stay focused on the goal: Keep the purpose of the project in mind - providing insights about mortgage rates that are actionable and meaningful.
- Communicate clearly: As you work through the analysis, think about how to present your findings in a way that is accessible and impactful to your audience.
- Time management: Set milestones to ensure steady progress. Don't wait until the last minute to complete your analysis or prepare your deliverable.

**How will I know I have succeeded?** You will meet expectations on this case study when you follow the criteria in the rubric below.

Spec Category	Spec Details
Formatting	<ul style="list-style-type: none"> <li>• One GitHub Repository (submitted via link on Canvas)</li> <li>• To ensure reproducibility, the repository will adapt parts of the TIER Protocol 4.0. In a nutshell, the top-level page of the repository should contain: <ul style="list-style-type: none"> <li>○ A README.ms file (which auto displays)</li> <li>○ A LICENSE.md file (use MIT as default)</li> <li>○ A CODE folder</li> <li>○ A DATA folder</li> <li>○ An OUTPUT folder</li> </ul> </li> </ul>
A README.md	<ul style="list-style-type: none"> <li>• <u>Goal:</u> This file serves as an orientation to everyone who comes to your repository</li> <li>• Should contain a summary of what you've produced for the case study</li> <li>• Use markdown headers to divide content into: <ul style="list-style-type: none"> <li>○ Software and platform section</li> <li>○ Map of your documentation</li> <li>○ Instructions for reproducing your results</li> </ul> </li> </ul>
LICENSE.md	<ul style="list-style-type: none"> <li>• <u>Goal:</u> This file explains to a visitor the terms under which they may use and cite your repository.</li> <li>• Select an appropriate license from the GitHub options list on repository creation.</li> <li>• Usually, the MIT license is appropriate.</li> </ul>
CODE folder	<ul style="list-style-type: none"> <li>• <u>Goal:</u> This folder contains all the code used to reproduce the results of your project in a well-documented notebook.</li> <li>• Keep code clean and well-organized so others can easily read, understand, and reproduce your code.</li> </ul>
DATA folder	<ul style="list-style-type: none"> <li>• <u>Goal:</u> This folder contains all the data for this project</li> <li>• Must include: <ul style="list-style-type: none"> <li>○ Initial raw data (if applicable)</li> <li>○ Final cleaned data</li> </ul> </li> </ul>
OUTPUT folder	<ul style="list-style-type: none"> <li>• <u>Goal:</u> This folder contains all the output generated by your project, e.g. figures, tables, etc.</li> <li>• Use informative names for your files.</li> </ul>
References	<ul style="list-style-type: none"> <li>• All references should be listed at the end of the README.md using IEEE documentation style</li> </ul>

Acknowledgements: Special thanks to Professor Alonzi for providing the rubric structure.