Parking Ticket Spatial Analysis Case Study Rubric

DS 4002 | Instructor: Loreto Alonzi

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Why am I doing this?

This case study gives you the chance to apply your growing data science skills to a real Charlottesville dataset and see how those tools can answer meaningful, local questions. You'll get hands-on experience working with time-series and spatial data, cleaning and analyzing it to uncover real-world patterns. The project also builds your ability to interpret and communicate data-driven insights clearly – a key skill for any data scientist.

- <u>Learning Objective</u>: apply data science methods to real-world data to generate and communicate insights.

What am I going to do?

In this case study, you'll explore real data from the City of Charlottesville's Open Data Portal to uncover patterns in parking ticket issuance. You'll begin by downloading and cleaning the dataset to prepare it for analysis, focusing on time, location, and violation details. Next, you'll run scripts that visualize ticket frequency through an interactive heatmap of Charlottesville, showing where enforcement is most concentrated. You'll then build a simple predictive model that estimates the likelihood of receiving a ticket at a specific address compared to other parts of the city.

Deliverables include:

- GitHub repository with your code, analysis, and outputs
- Interactive heatmap of ticket density
- Predictive model for ticket likelihood

Tips for Success:

- Contextualize the project. To get the most out of this project, it's helpful to understand the type of analysis you'll be doing. Read and understand the supplemental materials and carefully parse through the entire repository. This will help you stay on track and will make the learning experience more valuable.
- Follow instructions. The GitHub Repository is designed to carefully walk you through the case study. If something seems unclear or missing, take another look through the repository.
- Ask for help. Data science can be difficult. Don't be afraid to ask your instructor or classmates for help if problems arise.
- Be curious. This is your chance to work with data in a well-structured way. If there is anything else you'd want to learn or create from the data, go ahead and let your imagination run!

How will I know that 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	- One GitHub Repository containing: - README.md - LICENSE.md - SCRIPTS folder - DATA folder - OUTPUT folder
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 - Section 1: Context - Explain the details of the project. What are you doing, and why is it important? - Section 2: Documentation Map - In this section, you should provide an outline or tree illustrating the hierarchy of folders and subfolders contained in your Project Folder, and listing the files stored in each folder or subfolder. - Section 3: Results and Reflections - Summarize your findings - This section should explain what outputs you generated, what we can learn from them, and how those findings could be used
LICENSE.md	- Goal: This file explains to a visitor the terms under which they may use and cite your repository - A license should already be provided from the original repository. If the license is deleted, use the MIT license
SCRIPTS folder	- Goal: This folder contains all the source code for your project - Place all code scripts used for this project into this folder - These should include the initial case study scripts and any additional code generated - All script files should include header comments at the beginning of a script to provide information that anyone working with or executing the script should be aware of. Throughout all your scripts, you should include copious comments explaining what each command or sequence of commands accomplishes and what the purpose is
DATA folder	- Goal: This folder contains all of the data for this project - If GitHub allows, you should include the initial data and the cleaned data that you did analysis with - If the data does not fit in GitHub, use a single file that explains the process to

	obtain the dataset and describes what preprocessing is required

OUTPUT folder	• <u>Goal</u>: This folder contains all of the output generated by your project, e.g. figures, tables, etc.
	• This folder should contain the heatmap generated during analysis
	• Reflection:
	    o Summarize what you learned and took away from this project
	    o Format: pdf, one-page maximum