Pandemic-Related Traffic in NYC

A UVA Data Science Case Study by Grace Berrien, 2022

Prompt:

New York City is known for its bright yellow taxi cabs and also the traffic that comes along with them. Rush hour in New York City is generally understood as the commuting times to and from work, from 7-9am and 4-6pm on weekdays [2]. Although rush hour became less congested during the height of the Covid-19 pandemic with the start of remote working, did accidents caused during rush hour similarly decline to the same extent?

In May 2022, NYC Mayor Eric Adams launched a $4m campaign to "counter rising traffic violence and curb dangerous driving behaviors that have occurred at higher rates since the onset of the COVID-19 pandemic" [1]. This campaign, titled "Vision Zero" seeks to eliminate all traffic fatalities and aims to reach New Yorkers across all 5 boroughs.

Deliverable: Using the provided dataset, attached below, create a statistical test to predict and test if traffic accidents have increased due to COVID, and if so, percentually by how much. Include all outside research materials, all python files used to create the test, and all statistical testing and results. Assess your work based on the rubric and also relate your findings back to Adams's "Vision Zero"initiative: although this data is from January 1, 2020 through August 2020, is this program necessary for the city based on your findings? Try to think about to what extent COVID increased traffic accidents and if you deem it wise to instate a program like this in 2022 as a result (For more detail, see rubric CS-Traffic).

Data source to initially use (you can build off of it if you need but begin with this data):
https://www.kaggle.com/datasets/mysarahmadbhat/nyc-traffic-accidents?resource=download

Sources:

[1] Eyewitness News, "Graphic billboards going up across New York City to warn about the dangers of speeding," *ABC7 New York*, 2-May-2022. [Online]. Available: https://abc7ny.com/billboards-new-york-city-mayor-eric-adams-vision-zero/11811316/. [Accessed: 12-Dec-2022].

[2] H. Law, "Safety Tips for rush hour traffic," *Heintz Law*, 19-Dec-2019. [Online]. Available: https://www.heintzlaw.com/tips-for-rush-hour-traffic/. [Accessed: 09-Sep-2022].

CS-NUKE Rubric

DS 1000 – Spring 2023 - Professors Alonzi & Wright
Due: March 15, noon
Submission format: Link to github repository (collab assignments) and hard copy (in class)

Individual Assignment

General Description: Submit to collab assignments a link to your case study repository and a hard copy of the README.md file to the head TA in class.

Preparatory Assignments – Class sessions about case study reading. Class sessions about logic and problem solving. Guest speaker, Joe Smith, about probabilistic thinking and frequentist vs Bayesian mindset.

Why am I doing this? We read and produce solutions to case studies to practice thinking like a data scientist. In this example the focus is on problem solving and using a probabilistic mindset. In this case it is a historical example with ample literature written about the actual events as they transpired. You are encouraged to work the case study on your own, then research the topic, and finally improve your solution. Tackling the problem first without the real-world solution is a good chance to stretch yourself and then take in more information to locate your strengths and your weaknesses.

- Course Learning Objective: logic and problem solving (nb: placeholder)
- Course Learning Objective: applied thinking (nb: placeholder)
- Course Learning Objective: presentation of thinking (nb: placeholder)

What am I going to do? You will begin by reading the one-page prompt for this case study. In that prompt you will be given a challenge. Take time to reflect on that and make notes. If you have ideas, play with them and come up with thoughts. Then make a plan to produce the main deliverable. That deliverable is an algorithm written in English contained in the README.md file of your github repo. As you develop your solution more materials will be added to the repository. Then you can engage with the supplemental materials and improve your solution. You will pay attention to what ideas you had that were also used by the US Navy in solving the problem. Also pay attention to ideas they had that you did not and reflect on that discrepancy. You will learn from their experience. Then the final part is to construct an assessment metric for your algorithm. That metric will be designed to answer the question "How can you show that your algorithm is better than a random search".

Tips for success:

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- Have fun. This prompt is written in a dramatic role-playing fashion. Lean in to that.
- Don't constrain yourself. This is not a problem with right and wrong answers. You will be asked to justify your solution, but that does not mean you should ignore creative ideas.
- Take time to think about the prompt before researching the topic. Explore your ideas and take a stand. Then do research and compare your ideas with the real-world events.

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

Spec Category	Spec Details

Formatting	• Repository – A new github repository
	  • Create a new github repo for this assignment containing
	  • README.md
	  • LICENSE
	  • Images folder

README.md	• Goal: This file is what will be assessed for the assignment. You should plan to print this out and submit it in class • Structure this file in such a way to be easily readable by an individual who has read the prompt • Include your algorithm (in English) • Include your assessment metric • Include references • markdown format
Algorithm	• Goal: Written steps in English that describe how you would implement a search for the missing nuke. • Use an enumerated list • Write in plain English • Refer to mathematical techniques as appropriate but do not go into detail and show equations
Assessment Metric	• Goal: Describe how you would evaluate your algorithm and compare it to other algorithms. • This is a quantifiable step but it itself is not about the mathematics • This is about the approach you would take.
LICENSE	• Goal: Explain to readers the terms under which they may use and share your work. • The MIT license is the default recommendation
Images folder	• Goal: Include all images you embed in your readme file. • This folder will contain image files

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