CVEN5301 - Advanced GIS: Mini Project 1

- You are required to work individually on this project.
- You need to submit a Jupyter Notebook and Relevant files (Input files) in a zip format via Github link. Your notebook should be well annotated and include text blocks explaining your results and reasoning.

In this project you will work with national bridge inventory data (NBI) that is available at: https://www.fhwa.dot.gov/bridge/nbi.cfm

Download two consecutive years of data (say 2022 and 2023) for Texas. Identify those bridges that were surveyed in 2023 but not in 2022. Show these on a map,

Your goal will be to predict the bridges sampled in 2023 (but not in 2022) as to their Rating of the Deck, Culvert and Channel /Channel Protection. These are coded in values of 0 – 9. Divide them into two categories Less than Satisfactory (0) ; Satisfactory or better (1).

Perform a logistic regression to predict the probability of the Bridge elements being less than satisfactory. Use the inputs available about the structure, loading, age, etc that are available. You can do a quick literature review to see what others have used.

Predict the state of the bridges that were not sampled in 2022 but in 2023. Visualize these using a map. Color code the probabilities to indicate risk of failure (defined here as probability of being less than satisfactory).

You shall use Python for the project.

Useful Reference:
Recording and Coding Guide for Inventory and Appraisal of National Bridges – FHWA Report
Available online: https://www.fhwa.dot.gov/bridge/mtguide.pdf