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December 18, 2025

Advanced Data Visualization - Final Project Brief

Below is the outline for our final project for the Advanced Data Visualization course.

Link to Dashboard Link to Presentation

Overview

Our mission is to identify areas of opportunity in the city of South Bend commensurate with the Mayor's stated priorities. We achieved this by creating an interactive dashboard with the following four major sections:

1. Overall livability score for each zip code that will be calculated using rankings on the density of parks, businesses, street lights, fire stations, and abandoned properties.
2. Assess the relationship between street lighting, crime, and proximity to police stations.
3. Identify areas that may be ripe for investment by tracking cumulative abandoned properties in the city over time and where they are located relative to the city's parks, libraries, and fire stations.
4. Analyze the demographics of the school zones in South Bend to get a sense of where best to invest in underprivileged children.

Design/User Interface

We built a Shiny dashboard with a homepage and four tabs corresponding to the goals above:

- **Tab One**: Interactive map where the user selects a zip code, which then highlights that area on the map. Clicking on the zip code shape will reveal the livability score as well as some facts about that area.
- **Tab Two**: Interactive map that shows the locations of police stations, street lights, crimes, and crime hotspots. A legend allows the viewer to select which of these data points they would like to see. A slider controls the range of street light data points shown by lumens. The map shows poorly lit areas are correlated with increased crime. The

crime hotspot data points represent individual light poles that have low lumens and are in proximity to the most crimes.

- **Tab Three**: Interactive map that aims to show cumulative abandoned properties over time to see whether there is an increasing or decreasing trend. Will also add toggles to see where these abandoned properties are in relation to facilities like parks, libraries, and fire stations.
- **Tab Four**: Interactive visuals of demographic data for school zones including race and income levels, and distribution of race by school zone. Slider to filter by school zone based on population ranking.

We have presented an information-dense analysis through visuals that remain simple and easy-to-use, highlighting only the key relationships. Because our audience is a busy local political office with varying levels of technical expertise, our storytelling is straightforward and accessible. On each tab, we included a brief summary of the main findings of the visualization for quick reference as well as annotations to draw attention to areas of interest. Of course, we applied the principles of good data visualization, made the code as readable as possible, and kept the toggles/animations in the dashboard to a minimum to keep it running smoothly.

Audience Analysis

The audience for this dashboard is Mayor James Mueller, who was elected Mayor of South Bend in 2020 and re-elected in 2024. This data will be used to inform political decisionmaking in the mayoral office, which has lately been focused on crime, homelessness, and general economic decline in the area. Mayor Mueller has named public safety and education as some of his top priorities. Through this dashboard, we are able to visually demonstrate the “pulse” of the city and the impacts of his political agenda on those priorities.