Crime Lens of Charlotte

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# Problem Statement

As part of my MADS coursework projects, I've been developing a housing market prediction application that requires understanding neighborhood characteristics, including crime patterns. While crime data significantly impacts property values and community decisions and Charlotte residents currently lack an accessible, interactive tool to understand and explore this data effectively.

The Charlotte-Mecklenburg Police Department provides raw crime data, but existing formats (CSV files, static reports) create barriers to our understanding:

* Spatial crime patterns and hotspots are invisible in spreadsheet formats
* Trends require manual analysis to identify
* Relationships between crime types, locations, and time periods remain hidden
* Community members cannot easily assess neighborhood safety for housing, business, or personal decisions

# Objective

Create a standalone interactive crime visualization dashboard using D3.js that transforms Charlotte's raw crime data into intuitive, explorable visualizations. The dashboard will use zip codes as the primary unit of geographic analysis, aligning with available Charlotte data infrastructure and providing meaningful geographic boundaries that residents understand. This project will apply data visualization and communication principles learned to make crime data accessible and actionable for Charlotte residents, while building skills that will enhance future iterations of my housing market analysis tools.

# Rough Plan of Work with Approximate Milestones

### Week 4-5: Data Search & Setup

* Acquire crime data from [Charlotte Open Data Portal](https://data.charlottenc.gov/) and neighborhood [GeoJSON](https://data.charlottenc.gov/datasets/zip-codes/explore) files
* Clean and preprocess data
* Initial exploratory analysis
* Set up D3.js dev environment

### Week 5-7: Basic Visualizations (Checkpoint 1)

* Implement Charlotte base map with neighborhoods
* Create crime incident scatter plot
* Build initial bar chart for crime types
* Add basic tooltips and legends

### Week 7-10: Advanced Features

* Develop heat map visualization
* Add temporal trend line chart
* Implement filtering controls (date, type, location)
* Create coordinated interactions between views

### Week 10-12: Dashboard Integration (Checkpoint 2)

* Combine visualizations into cohesive dashboard layout
* Add neighborhood comparison features
* Implement performance optimizations
* Conduct informal user testing

### Week 12-13: Final Polish

* Refine visual design and interactions
* Complete documentation and write-up
* Prepare final presentation

# Deliverables

## Primary Artifact

An interactive single-page web application featuring:

* **Map View**: Crime heat map/choropleth of Charlotte neighborhoods
* **Temporal View**: Line chart showing crime trends over time
* **Category View**: Bar chart breaking down crime types
* **Filters**: Date range, crime type, and neighborhood selectors
* **Coordinated Interactions**: Linked views that update together

**Technical Components**

* Complete D3.js codebase with modular JavaScript
* Processed Charlotte crime dataset
* Charlotte neighborhoods GeoJSON
* Documentation and setup instructions

**Academic Deliverables**

* 4+ page write-up (IEEE VIS format) with related work, design justifications, and findings
* Final presentation with live demo
* Project post-mortem reflection