Crashspot – Week 3 Report

Week 3 focused on spatial clustering of Monroe crashes (2022–2023) and overlaying these crash data onto Monroe's road network. The goal was to identify clusters of crashes and highlight road segments with elevated fatal crash counts.

1. Crash Clustering (DBSCAN)

We applied DBSCAN (Density-Based Spatial Clustering of Applications with Noise) to Monroe's fatal crashes. Using a neighborhood radius (eps) of 600 meters and a minimum of 3 crashes per cluster, DBSCAN identified one cluster while most points were classified as noise. This indicates Monroe's fatal crashes are relatively dispersed.
Outputs:
• fars_monroe_clusters.geojson – crashes with cluster_id assigned
• monroe_cluster_sizes.png – bar chart of cluster sizes
• week3_monroe_clusters.html – interactive cluster map

2. Road Overlay Analysis

We downloaded Monroe's OpenStreetMap (OSM) road network using OSMnx (or Overpass API) and clipped the data to Monroe's crash extent. A spatial join was performed to assign crash counts to road segments (nearest within ~30 m). This produced a crash density map of roads.
Outputs:
• monroe_roads_with_crash_counts.geojson – roads with crash_count field
• week3_monroe_roads_counts.html – interactive roads crash density map

3. Key Insights

• Fatal crashes in Monroe are sparse, with DBSCAN detecting only one significant cluster.
• Road overlay analysis reveals which road segments have higher fatal crash counts.
• Together, these analyses highlight spatial patterns useful for safety interventions.

4. Next Steps (Week 4 Preview)

Week 4 will extend this analysis by generating kernel density estimation (KDE) heatmaps to visualize crash intensity as continuous surfaces, and by comparing Monroe's hotspot patterns with statewide Louisiana crash data.