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Project Name: Unveiling Insights of Chicago Crime

Main Topic: Analyzing and predicting crime patterns in Chicago using machine learning algorithms and visualization techniques.

Importance: Understanding crime patterns in Chicago is crucial for enhancing public safety and implementing effective crime prevention strategies.

Dataset Description: The dataset comprises over 7.62 million reported crimes in Chicago from 2001 to the present, excluding murders. It includes various attributes such as date, type of crime, location description, district, longitude, latitude, and whether an arrest was made. The dataset's primary focus is on Illinois Uniform Crime Reporting (IUCR) codes, enabling comprehensive categorization of criminal incidents.

Methodology: We plan to employ classification algorithms including Logistic Regression, Decision Tree, Support Vector Machine, KNN Classifier, and Random Forest to predict crime types. Standard scaling and grid search will be utilized for feature scaling and parameter optimization, respectively. Additionally, ensemble modeling will be implemented to address overfitting and variance issues. Evaluation will be done using metrics like confusion matrix, accuracy score, and RSME value, supplemented with precision, recall, and F1 scores.

Expected Results: The project aims to identify high-crime neighborhoods in Chicago, offering insights into crime trends and patterns. Visualization tools such as Tableau and Stream lit will provide interactive dashboards allowing users to explore crime data based on various filters like date range, primary type, location, and arrest status. The expected outcomes include a comprehensive understanding of crime distribution and hotspots in Chicago, facilitating informed decision-making for crime prevention and law enforcement strategies.