Crime Rate Prediction Using ARIMA

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Introduction

Crime_Rate_Prediction is a machine learning project aimed at predicting crime rates based on various factors. The goal is to provide insights and predictive analytics to help law enforcement and policymakers take proactive measures.

Features

- Data preprocessing and cleaning
- Exploratory Data Analysis (EDA)
- ARIMA (AutoRegressive Integrated Moving Average)
- Feature selection and engineering
- Model training and evaluation
- Visualization of results

Technologies Used

- Python
- Pandas
- NumPy
- Scikit-learn
- Matplotlib
- Seaborn
- Jupyter Notebook

Dataset

The dataset used for this project is obtained from kaggle. It includes various features such as demographic information, socioeconomic factors, and historical crime data.

Model Training

The project uses various machine learning algorithms to predict crime rates. The training process involves:

- Splitting the data into training and testing sets
- Normalizing and scaling features
- Training multiple models (e.g., Linear Regression, Random Forest, etc.)
- Hyperparameter tuning

Evaluation

Model performance is evaluated using metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and R-squared. The results are visualized using plots and charts for better understanding.