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Crime Rate Prediction Using Machine Learning

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ABSTRACT:

An analytical way to detect crime is crime analysis and prediction. This procedure is able to identify areas that are likely to have crime and anticipate regions with a high risk of crime. Through the application of data mining techniques, unstructured data can yield previously undiscovered and valuable insights. Using the current datasets, fresh information extraction is forecasted. Crime is a perilous and widespread social issue that affects people all around the world.Crimes have an impact on the standard of living, national prestige, and economic prosperity. To safeguard society from criminal activity, innovative methods and sophisticated systems for enhancing crime data are required in order to safeguard local communities.. We offer a system that can assess, identify, and estimate diverse crime possibilities in an area in question. This research uses multiple data mining techniques to clarify criminal analysis and crime prediction. Predicting levels of crime has drawn a lot of curiosity lately as law enforcement organizations look for more efficient ways to stop and execute illicit behavior. The goal of this study is to study how rate of crime can be estimated via spatial analysis, social and economic factors, and predictive modeling techniques. We assess several strategies to forecast the rate of crime via an in-depth review of the literature, including temporal analysis techniques, machine learning algorithms, and geographical technology. We also look investigate the correlation with crime trends and demographic variables like unemployment, poverty, and educational attainment, as well as the ethical impacts of predictive policing. The results of this study demonstrate how predictive analytics technologies may be used to identify crime hotspots, spend resources efficiently, and enhance public safety outcomes. Yet privacy, algorithmic bias, and community distrust emphasize the importance it is for open governance systems and ethical guidelines in creating and using crime prediction models. In spite of adding to the growing body of knowledge on crime rate prediction, this study provides useful data for criminal justice

Keywords: data analysis, predict, Python, unlawful, computer, system, problem, detect,

Introduction:

Our popularity is growing in the current era of the modern world, and citification carries significant general, financial, and environmental implications. However, it also presents challenges in terms of urban management, including public policy, traffic resource planning, environment and safe water quality, and public safety services. Not only do larger cities have the highest rates of crime, but reducing crime is also one of the most significant societal challenges in large metropolitan regions since it has an impact on people's socioeconomic position, security concerns, and child development. A technique called "crime rate forecast" makes use of various algorithms to calculate the rate of criminal activity based on historical data. We must go to different locations every day for work and pleasure, and we frequently deal with a variety of security concerns in our daily lives, includinglike stealing, abduction, intimidation, etc. When we need to go somewhere, we typically search for Google Maps first. It then displays one, two, or more routes to the location, but we always select the shortcut route because we don't fully understand the path conditions. This research analyzes the crime rate in historical areas at different times and introduces the design and implementation of a strategy based on past crime data. We use primary data that is collected from individuals based on their prior criminal history for this work. Is it really safe, which is why we are faced with so many unpleasant situations?Predicting crime rates has become a crucial area of study and application for law enforcement and public safety in recent years. The availability of large amounts of data and the spread of cutting-edge technologies have made predictive modeling techniques—particularly those based on machine learning—more and more important for predicting crime rates. Machine learning algorithms provide a means of identifying patterns, trends, and risk factors linked to criminal activity by utilizing historical crime data, socio-economic indicators, and spatial-temporal analysis.Accurately forecasting crime rates has important ramifications for law enforcement organizations, decision-makers, and community members. In an endeavor to reduce crime and improve public safety, predictive models can support preemptive intervention, strategic planning, and resource allocation. Predictive analytics technologies can also assist in better allocating scarce resources and prioritizing interventions by identifying vulnerable people and high-risk locations. Nevertheless, there are a number of issues and concerns with the creation and application of machine learning-based crime rate prediction models. These include problems with algorithmic bias, privacy, and ethical ramifications, as well as challenges with data quality. Moreover, in order to

guarantee that predictive policing techniques preserve justice, equity, and the preservation of civil liberties, openness, accountability, and community involvement are necessary.

Literature Survey:

1. **Using data mining tools to forecast crime** [1]: In order to forecast future crime rates, this method applies data mining algorithms—such as decision trees, neural networks, and support vector machines—to past crime data. This method is explored in studies such as "Crime Prediction Using Data Mining" by Shrivastava et al. (2019). Utilizing data mining techniques, crime forecasting entails applying sophisticated analytical approaches to past crime data in order to forecast future criminal activity. Data mining is the process of finding patterns, correlations, and trends in massive databases of criminal episodes by utilizing technologies like statistical modeling, machine learning, and pattern recognition. These methods examine a range of variables, including time, place, socioeconomic status, and demography, to provide information that can help law enforcement organizations combat proactive crime. Authorities can more effectively allocate their resources, carry out focused interventions, and eventually lower crime rates in communities by predicting the locations and times of incidents. However, in order to prevent biases and guarantee the efficacy and equity of crime prevention initiatives, it's critical to manage and analyze the data ethically.

2. **Ethics in the context of crime prediction** [2]: Studies also address the moral and legal ramifications of employing algorithms to anticipate crime, given the possible biases and ethical issues surrounding predictive policing. An example of such a study is "Ethical Considerations in Predictive Policing: A Review of Empirical Evidence" by Lum and Isaac (2016). Crime prediction initiatives must take ethics very seriously, especially when using data mining tools. Making sure that predictive models don't reinforce or worsen preexisting biases in law enforcement procedures is one of the main problems. In the event that past crime data shows systematic injustices or discriminatory behaviors, biases may unintentionally find their way into algorithms. Thus, before using predictive models, it's critical to carefully evaluate and correct any biases in the data. Concerns about civil liberties and privacy are also present. Large-scale personal data analysis is frequently used to anticipate crimes, which raises concerns regarding the proper gathering, storing, and usage of this data. It is necessary to put safeguards in place to preserve people's right to privacy and stop sensitive data from being misused. In conclusion, even though crime prediction has the potential to improve public safety, ethical considerations must be carefully considered when using this technology. Through the mitigation of biases, protection of privacy, enhancement of openness, and consideration of wider society implications, stakeholders can create and implement crime prediction systems that are both morally and practically sound.

3. **Recognizing the socioeconomic factors that influence crime** [3]: The correlation between crime rates and socioeconomic variables like unemployment, poverty, educational attainment, and demographic traits is a topic of frequent research. This is covered in depth in studies such as "Socioeconomic Status and Crime: A Review of Recent Literature" by Mears et al. (2020). Comprehending the socio-economic factors that influence criminal conduct is crucial in formulating all-encompassing approaches to tackle and forestall illegal activity. Socioeconomic variables that might greatly affect a person's propensity to commit crimes include poverty, unemployment, inequality, and limited access to resources and education. People who experience extreme poverty and financial hardship may resort to crime as a means of surviving or as a way to get better circumstances. Feelings of dissatisfaction and pessimism brought on by unemployment might increase Furthermore, unequal economic distribution and inequality can lead to social unrest and animosity, which may encourage criminal activity. These problems can be made worse by a lack of access to high-quality social services and education, which reduces people's chances of breaking free from cycles of crime and poverty. Policymakers and community leaders can address the underlying causes of crime and advance social equity and opportunity by comprehending and addressing these socioeconomic determinants and implementing targeted interventions like job training programs, economic development initiatives, and social support services. Addressing socioeconomic gaps can also contribute to the development of stronger, more resilient communities where people are less likely to commit crimes.

4. **Predicting crime using geographic analysis** [4]: Crime patterns and future crime hotspot predictions are made using geographical analysis techniques like hot spot analysis and spatial regression models. Studies in this field include "Spatial Analysis and Geospatial Technology for Crime Prediction" (Chaney and Ratcliffe, 2005). Using geographical data, geospatial analysis for crime prediction can detect patterns and trends in criminal activity across several places. Law enforcement organizations can better allocate resources, identify high-risk regions, and comprehend the spatial dynamics of crime by combining geographic information systems (GIS) with crime data. By visualizing crime hotspots, geospatial analysis helps law enforcement focus their efforts on particular neighborhoods or areas with the greatest rates of crime. Additionally, By using geographic data and predictive modeling approaches, it is possible to predict future crime rates based on contextual factors and historical trends. Authorities can increase public safety, reduce crime, and allocate resources more efficiently within communities by utilizing geospatial analysis for crime prediction. To make sure that efforts to forecast crime maintain civil liberties and respect the rights of persons, it is necessary to address ethical and privacy concerns pertaining to the gathering and use of location-based data.

5. **Making use of open data sources and big data** [5]: Researchers are using big data sources like social media, CCTV footage, and open government data more often to improve crime prediction models as a result of the widespread use of digital technology. "Big Data Analytics for Crime Prediction" by Akinyemi et al. (2017) is one piece of research in this field. There are previously unheard-of chances to improve efforts at crime prediction and prevention by leveraging big data and open data sources. Large volumes of information from many sources can be analyzed by law enforcement authorities to spot patterns and trends in criminal activity thanks to big data, which is distinguished by

its pace, diversity, and volume. By compiling information from social media, sensor data, crime reports, and other sources Authorities may learn a great deal about the nature of crime in various places by utilizing public records and networks. Open data sources offer extra layers of information that can enhance analysis and guide decision-making processes. These sources include government databases, scholarly studies, and data generated by the community.

6. **Machine learning-based predictive policing** [6]: Predictive policing has made use of machine learning techniques, such as ensemble approaches and deep learning, that have been applied to crime data. The use of machine learning in crime prediction is covered in studies such as "Predictive Policing: The Role of Crime Forecasting in Law Enforcement Operations" by Mohler et al. (2015). Predictive policing offers several benefits, one of which is its more effective resource allocation. Law enforcement organizations are able to proactively assign personnel to high-risk regions, discourage criminal conduct, and act quickly in response to new threats. Predictive models can also assist in strategic decision-making, allowing law enforcement to focus interventions, prioritize crime prevention programs, and improve patrol routes in response to real-time intelligence. Still, The application of predictive policing must take ethics very seriously. When systemic injustices or discriminatory behaviors are reflected in past crime statistics, questions about bias and fairness are raised. It is imperative to address these biases and maintain accountability, transparency, and openness in the creation and application of machine learning algorithms. To safeguard people's right to privacy and stop sensitive data from being misused, safeguards must be in place. Predictive policing has the potential to improve public safety and lower crime rates despite these obstacles. Law enforcement organizations can take preemptive measures to avoid crimes, build community trust, and eventually make all inhabitants' environments safer and more secure by utilizing machine learning's predictive capacity.
8. **Crime data's temporal patterns** [7]: To find patterns and seasonal fluctuations in crime rates, temporal analysis techniques such as time series analysis and seasonal decomposition are used. This subject is covered in studies such as "Analyzing Temporal Crime Patterns: A Study of Seven Major Crimes in China" by Xu et al. (2018). The diurnal cycle, which describes changes in crime rates throughout the day, is one such temporal pattern. Since visibility is reduced and possible targets are less likely to be watchful throughout the night, several sorts of crime, including robberies and burglaries, tend to occur more frequently during this time. On the other hand, during daytime hours when companies are open and busy, crimes like fraud or shoplifting may increase. In crime data, seasonal trends often show up, with specific kinds of Long-term trends in crime data analysis might highlight cyclical patterns that recur every few years. These macro-level temporal patterns can be influenced by alterations in societal standards, law enforcement tactics, and economic downturns, which can have a long-term effect on crime rates. Law enforcement organizations can create focused plans for both crime prevention and response by analyzing temporal patterns in crime data. For instance, during peak hours or seasons of increased criminal activity, more patrols or monitoring techniques may be implemented. Furthermore, community outreach programs and public awareness campaigns can be designed to target particular temporal trends and encourage caution and safety during high-risk times. All things considered, utilizing temporal trends in crime data improves the efficiency of law enforcement efforts and helps to build safer communities.

Methodology:

- Input Data (Historical Data): The system receives historical crime data as well as pertinent socioeconomic, demographic, and environmental data. Researchers and law enforcement organizations can identify demographic, regional, and temporal patterns in criminal activity by examining historical crime statistics. For instance, they might find patterns that point to greater incidence of a given crime in a given neighborhood, at a given time of day or year, or among a particular set of people. Furthermore, the identification of potential risk factors for crime, such as socioeconomic circumstances, population density, or closeness to specific establishments, is made possible by historical data. Historical data is used as the training dataset for statistical models and machine learning algorithms in crime rate prediction. These algorithms forecast future criminal activity by analyzing historical patterns in crime data. Predictive models use historical data to anticipate where and when crimes are likely to happen. This information helps law enforcement agencies strategically deploy resources, carry out focused interventions, and eventually lower crime rates in their areas. But, as past crime data may reveal institutional injustices or prejudices in law enforcement procedures, it is crucial to identify and correct such potential biases. Furthermore, maintaining the accuracy and quality of data is crucial to the efficacy of crime rate prediction models. Through meticulous selection and examination of past data, interested parties can create more reliable and accurate forecasting models that support proactive measures to reduce crime and improve public safety.

- Preprocessing: In order to get the input data ready for analysis, preprocessing procedures such cleaning, addressing missing values, normalization, and feature engineering are applied. To begin with, data cleaning entails locating and addressing any missing or incorrect values in the dataset. In order to preserve data integrity, this can entail eliminating erroneous or incomplete entries or imputing missing values using statistical techniques. Second, two essential preprocessing stages are feature engineering and selection. This entails choosing pertinent features (such crime types, locations, and times, demographics) that are probably going to be predictive, as well as developing additional elements that could improve the model's prediction powers. For instance, generating spatial information like closeness to specific landmarks or crime hotspots, or temporal features like the day of the week or time of day. Thirdly, to make sure that characteristics have comparable ranges and are on a similar scale, data normalization or scaling can be required. This is crucial for machine learning methods that are sensitive to the size of input characteristics, including k-nearest neighbors and support vector machines. Additionally, categorical variables may be handled during preprocessing through the use of methods like label encoding or one-hot encoding, which transform categorical data into a numerical format appropriate for modeling. Additionally, data balancing strategies could be used to address problems with class imbalance in which certain crime categories are noticeably more common than others in the dataset. It is possible to prevent the predictive model from being skewed in favor of the dominant class by using strategies like oversampling minority classes and undersampling majority classes. Preprocessing, in general, is an essential stage in the prediction of crime rates since it establishes the

framework for creating reliable and accurate predictive models. Through efficient cleansing, transformation, and preparation of the input data, interested parties can create models that yield significant insights and support the development of more potent crime prevention tactics.

- Feature Selection: From the preprocessed data, pertinent factors that significantly affect crime rates are chosen. Feature selection can be done in a number of ways, such as filter, wrapper, and embedded techniques. In order to rank characteristics according to their significance to the target variable, filter approaches often use statistical measures like correlation, mutual information, or chi-square tests. Filter methods assess data independently of the predictive model. Conversely, wrapper approaches use several feature combinations to train and evaluate candidate models in order to evaluate feature subsets. The effect of feature subsets on model performance is directly measured using this method, however it can be computationally expensive, particularly for big datasets. Feature selection is integrated into the model training procedure itself through embedded approaches.in which, while being trained, the model automatically chooses the most pertinent features. Feature selection is an intrinsic aspect of the training process for techniques like Lasso (Least Absolute Shrinkage and Selection Operator) regression and tree-based algorithms like Random Forests or Gradient Boosting Machines. Feature selection aids in the identification of important variables that propel criminal behavior in crime rate prediction, allowing law enforcement to more efficiently allocate resources and actions. Predictive models can facilitate proactive crime prevention efforts and improve public safety by choosing the most useful features and provide actionable insights into crime hotspots, temporal patterns, and socio-economic factors.

- Model Training: To discover the patterns and correlations between the input features and crime rates, machine learning models are trained utilizing the chosen features and past crime data. In order to accurately anticipate future criminal behavior, machine learning algorithms are used in model training, a crucial step in the prediction of crime rates. These algorithms identify patterns and linkages in historical crime data. The preprocessed dataset, which usually includes characteristics like crime kinds, location, time, demographics, and socioeconomic variables, as well as the related crime rates, is given to the chosen algorithm during model training. Optimization, or learning, is the process by which the algorithm iteratively modifies its internal parameters in response to the input data in order to decrease the discrepancy between the actual and forecast crime rates. The objective is to create a predictive model that accurately represents the underlying patterns and trends in crime data and generalizes well to new data. The dataset is divided into training and validation subsets as part of the training phase. The model is trained on the training subset; its performance is assessed on the validation subset, and hyperparameters are adjusted to maximize the model's capacity for prediction and generalization.To guarantee resilience and avoid overfitting—a situation in which the model learns to memorize noise in the training data instead of capturing real underlying patterns—techniques like cross-validation may be used.For the purpose of predicting crime rates, a variety of machine learning methods can be used, such as neural networks, support vector machines, decision trees, random forests, and linear regression. The choice of method is influenced by various aspects, including the quantity of the dataset, the required interpretability of the model, and the complexity of the data. Each algorithm has pros and cons of its own.

- Model Evaluation: To gauge the performance and capacity for generalization of the trained models, assessment measures are employed. A crucial stage in predicting crime rates is model evaluation, in which the efficacy and performance of predictive models that have been trained are carefully examined to guarantee their dependability and appropriateness for practical uses. To assess the predictive accuracy, robustness, and generalization capacity of trained models, a range of validation approaches and metrics are applied. Accuracy, which quantifies the percentage of accurately predicted crime rates relative to all predictions, is a frequently used metric for assessing predictive models in crime rate prediction. Nevertheless, accuracy by itself would not be sufficient to offer a thorough evaluation of the model's performance, particularly in instances with unbalanced datasets where some crime categories are noticeably more common than others. Particularly in imbalanced classification problems, additional assessment metrics like precision, recall, and F1-score are frequently used to provide a more comprehensive view of model performance. Recall calculates the percentage of true positive predictions among all real positive instances, whereas precision calculates the percentage of true positive forecasts across all positive predictions. The F1-score is a balanced indicator of a model's capacity to accurately identify positive instances while reducing false positives and false negatives. It is calculated as the harmonic mean of precision and recall.

- Prediction Generation: Using the input attributes and chosen time periods as a basis, the trained models are utilized to forecast future crime rates. In order to create forecasts of crime rates for particular time periods and geographic regions, the trained model uses learnt parameters to process input data comprising pertinent features such crime kinds, location, time, demographics, and socioeconomic factors. By identifying prospective crime hotspots, temporal trends, and socioeconomic elements that contribute to criminal behavior, these forecasts can help stakeholders put proactive crime prevention plans and targeted interventions into action.In law enforcement, the precision and dependability of predictions produced by machine learning models play a crucial role in guiding resource allocation and decision-making. Therefore, to guarantee predictive models' efficacy in practical applications, it is imperative to thoroughly assess their performance utilizing validation methodologies and indicators. In addition to supporting proactive efforts to reduce crime, prediction generation in crime rate prediction also gives communities the ability to more effectively identify and address the root causes of criminal activity. Law enforcement organizations and legislators can create evidence-based plans to improve public safety, lower crime rates, and build better, more resilient communities by utilizing the insights offered by predictive models.

- Expected Results: For purposes of additional analysis, visualization, or decision-making, the prediction results are exported together with any extra insights or reports. For the purpose of predicting crime rates, a data flow diagram (DFD) shows how data flows through various system operations and data repositories. This is a condensed DFD for forecasting crime rates.

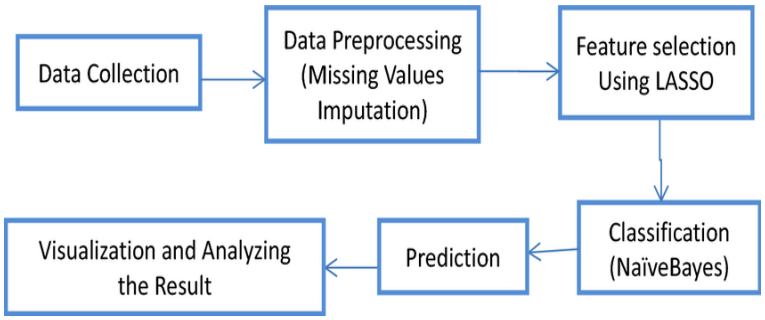
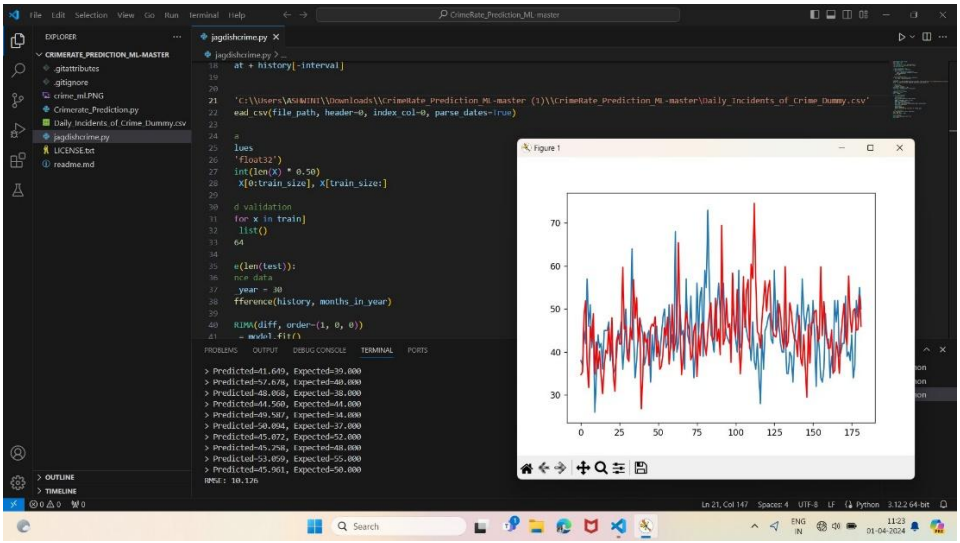


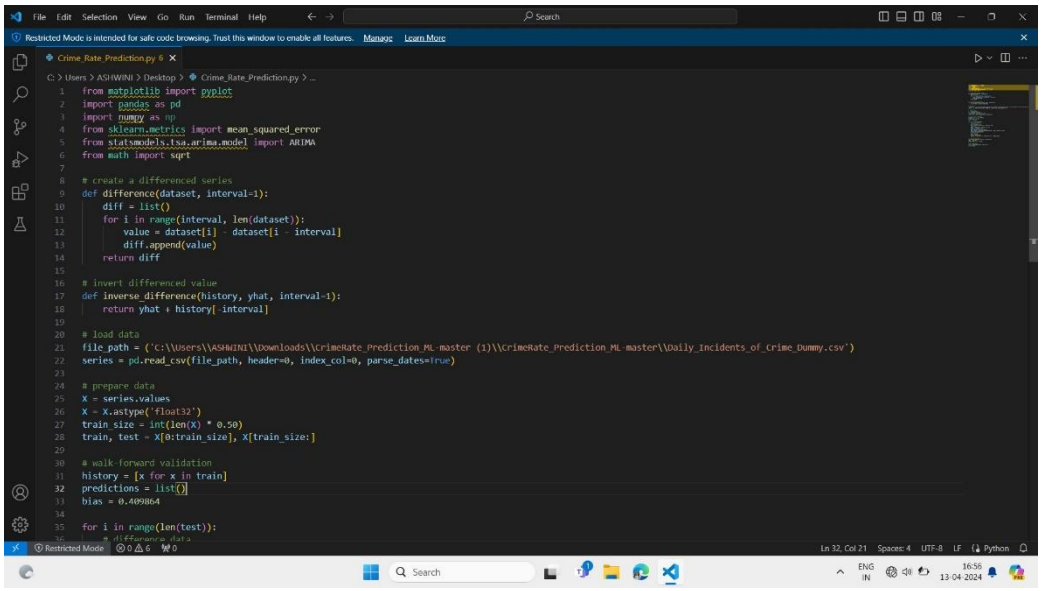
Fig: Block Dia gram of the method followed

Results:

In the image below, the vs main window is displayed along with the main code

After the main code is executed we get the output of crime rate prediction is displayed the two lines which is red and blue, Red line indicates the original crime and blue line indicates the predicted crime.





```python
from matplotlib import pyplot
import pandas as pd
import numpy as np
from sklearn.metrics import mean_squared_error
from statsmodels.tsa.arima.model import ARIMA
from math import sqrt

# create a differenced series
def difference(dataset, interval=1):
    diff = list()
    for i in range(interval, len(dataset)):
        value = dataset[i] - dataset[i - interval]
        diff.append(value)
    return diff

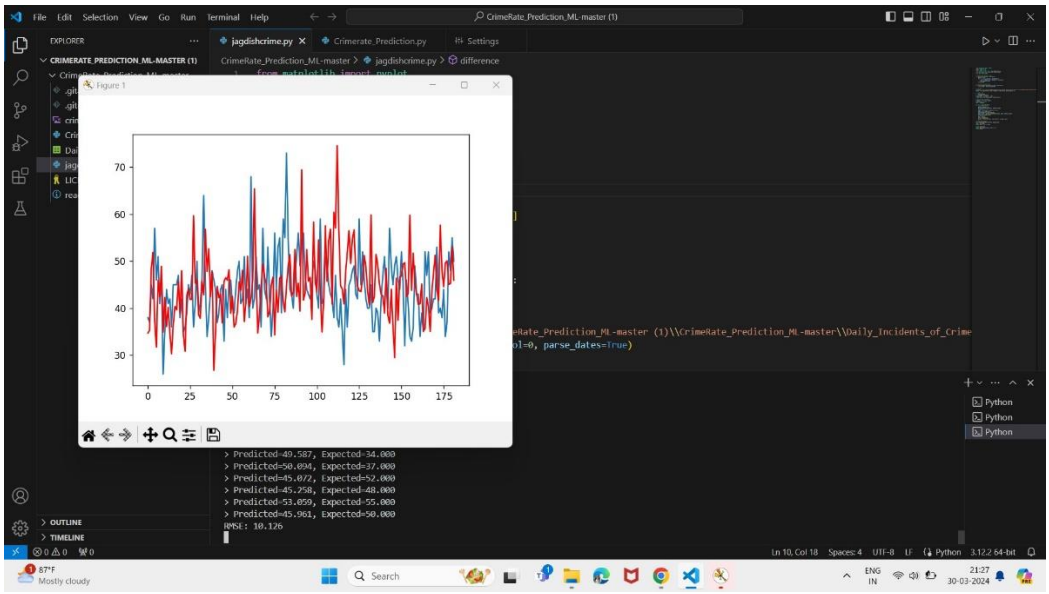
# invert differenced value
def inverse_difference(history, yhat, interval=1):
    return yhat + history[-interval]

# load data
file_path = ('C:\\Users\\ASHWINI\\Downloads\\CrimeRate_Prediction_ML-master (1)\\CrimeRate_Prediction_ML-master\\Daily_Incidents_of_Crime_Dummy.csv')
series = pd.read_csv(file_path, header=0, index_col=0, parse_dates=True)

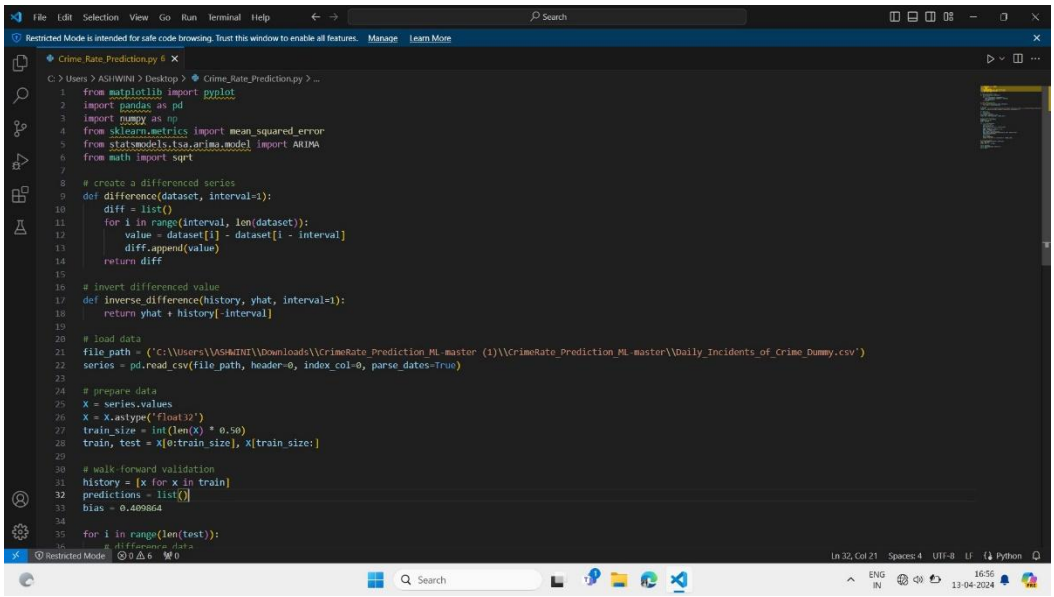
# prepare data
X = series.values
X = X.astype('float32')
train_size = int(len(X) * 0.50)
train, test = X[0:train_size], X[train_size:]

# walk-forward validation
history = [x for x in train]
predictions = list()
bias = 0.409864

for i in range(len(test)):
```



```
> Predicted=49.587, Expected=34.000
> Predicted=50.094, Expected=37.000
> Predicted=45.072, Expected=52.000
> Predicted=45.258, Expected=48.000
> Predicted=53.059, Expected=55.000
> Predicted=45.961, Expected=50.000
RMSE: 10.126
```

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bias = 0.409864

for i in range(len(test)):
```

Conclusion:

In summary, the field of crime rate prediction is diverse and dynamic, with great potential to improve public safety, guide law enforcement tactics, and assist evidence-based legislation. By incorporating sophisticated analytical methods such as machine learning, spatiotemporal analysis, and socio-economic modeling, scholars and professionals can create predictive models that pinpoint areas of high crime, foresee new threats, and more efficiently distribute resources. To guarantee that predictive analytics technologies are utilized responsibly and ethically, it is crucial to address ethical issues such algorithmic fairness, transparency, and privacy. In addition, the effectiveness of crime rate prediction programs depends on cooperation between local communities, government agencies, law enforcement agencies, and academic institutions. A community's specific requirements and objectives can be catered for by co-creating solutions with stakeholders through partnerships and the sharing of data, expertise, and best practices. Furthermore, longitudinal studies are required to determine the long-term effects of predictive police tactics as well as how well they work to lower crime rates and enhance public safety results.

In conclusion, even though crime rate prediction presents exciting potential to improve law enforcement and crime prevention initiatives, this topic must be approached carefully, sensitively, and with a dedication to ethical standards. We can use predictive analytics to build safer, more resilient communities for everyone by utilizing state-of-the-art technology, interdisciplinary teamwork, and community involvement. The goal of this is to create prediction models for the monthly crime rates of each category of crime. India's crime rates are rising daily for a variety of reasons, including increased poverty, poor governance, corruption, etc. When it comes to implementing the required actions to lower crime, the suggested model is highly helpful to both police officers and investigating organizations. Through a variety of interactive visualizations, the project assists the criminal analyst in its investigation of these crime networks. Future iterations of this research will focus on teaching bots to anticipate crime-prone areas through machine learning methods. Because machine learning and data mining are comparable, advanced machine learning methods can be applied to improve prediction.

REFERENCES:

Hardware requirements for developers:

1. System : intel Core i5
2. Hard Disk : 1 TB.
3. Monitor : 15’’ LED
4. Input Devices : Keyboard, Mouse
5. Ram : 8 GB.

Software requirements for developers:

1. Python (PIP) Version 3.7.
2. PyCharm Edition 20.20.3.
3. Excel files for storing Data.

Research Papers:

- Mohler et al. (2015), "Predictive Policing: The Role of Crime Forecasting in Law Enforcement Operations"
  An overview of predictive policing tactics and the use of crime forecasting methods to law enforcement operations is given in this study. It talks about how predictive analytics techniques are used and how they affect attempts to prevent and detect crime.
- Shrivastava et al.'s "Crime Prediction Using Data Mining Techniques" (2019)
  The use of data mining methods for crime prediction, such as decision trees, neural networks, and support vector machines, is investigated in this paper. It assesses various algorithms' performance and talks about how that affects applications of predictive policing.

- Mears et al.'s "Socioeconomic Status and Crime: A Review of Recent Literature" (2020)
  This essay examines current research on the connection between crime rates and socioeconomic position. It looks at how income disparity, unemployment, education, and poverty affect criminal conduct and talks about how this affects crime prediction models.
- Chainey and Ratcliffe's "Spatial Analysis and Geospatial Technology for Crime Prediction" (2005)
  This study investigates the application of geospatial technologies and spatial analysis methods to crime prediction. It covers techniques for locating crime hotspots, examining spatial patterns, and creating forecast models using spatial data.
- Akinyemi et al.'s "Big Data Analytics for Crime Prediction" (2017)
  This study looks at the use of big data analytics to forecast crime utilizing a variety of data sources, such as open government data, CCTV footage, and social media. The advantages and disadvantages of using big data for predictive police programs are covered.
- Lum and Isaac (2016) "Ethical Considerations in Predictive Policing: A Review of Empirical Evidence"
  This study looks into the moral issues around algorithmic prejudice, privacy, and civil liberties in relation to predictive policing. Reviewing empirical data, it addresses the implications for practice and policy as well as the effects of predictive analytics tools on communities.
- According to Xu et al. (2018), "Analyzing Temporal Crime Patterns: A Study of Seven Major Crimes in China"
  This study looks at the seasonality and cyclical characteristics of seven major crimes in China, as well as temporal patterns in crime statistics. The implications of temporal analysis for methods of crime prevention and prediction are covered.