Tech Saksham

Capstone Project Report

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FUNDAMENTALS

"An End-to-End Data Science Project with ChatGPT"

"UNIVERSITY COLLEGE OF ENGINEERING (BIT CAMPUS) TIRUCHIRAPALLI"

NM ID	NAME
au81002114016	BALA MUNIYANDI G

Trainer Name

Ramar Bose

Sr. AI Master Trainer

ABSTRACT

This succinct end-to-end data science with ChatGPT project revolves around predicting loan default using a loan dataset from a financial institution. It entails data preprocessing, exploratory data analysis, and feature engineering to prepare the dataset for modeling. Leveraging machine learning algorithms like logistic regression, decision trees, random forests, and gradient boosting, predictive models are developed to forecast the likelihood of loan default. Feature importance analysis guides the identification of key predictors. Rigorous model evaluation ensures reliability and generalization. Ultimately, the best-performing model is deployed for real-time predictions, aiding financial institutions in proactive risk management and fostering a stable lending environment.

INDEX

Sr. No.	**Table of Contents**	**Page No.**
1	Chapter 1: Introduction	4
2	Chapter 2: Services and Tools Required	6
3	Chapter 3: Project Architecture	7
4	Chapter 4: Modeling and Project Outcome	9
5	Conclusion	18
6	Future Scope	19
7	References	20
8	Links	21

CHAPTER 1

INTRODUCTION

1.1 Problem Statement

The goal of this project is to develop a comprehensive loan approval system using machine learning techniques and natural language processing (NLP) capabilities of ChatGPT. Leveraging a dataset of past loan applications, the project aims to build a predictive model that can assess the creditworthiness of new applicants based on their financial history and personal information. Additionally, integrating ChatGPT into the system will enable the automation of customer interactions, allowing for a more seamless and efficient loan application process. By combining advanced analytics with conversational AI, the project seeks to improve the accuracy and speed of loan approvals while enhancing the user experience for both applicants and loan officers.

1.2 Proposed Solution

For an end-to-end data science project utilizing ChatGPT with a loan dataset, the proposed solution involves several key steps. First, comprehensive data preprocessing is necessary to clean and prepare the loan dataset, including handling missing values and outliers. Next, feature engineering can help extract relevant information from the data to improve model performance. Then, a machine learning model, such as logistic regression or random forest, can be trained to predict loan approval or rejection based on historical data. Integration of ChatGPT allows for a conversational interface where users can inquire about loan eligibility criteria, receive personalized recommendations, or seek assistance with the loan application process. Finally, thorough testing and evaluation ensure the model's accuracy and effectiveness in real-world scenarios.

1.3 Feature

- **Data Gathering**: Collect loan dataset with borrower information.
- **Model Training**: Train ChatGPT on the loan data to understand queries.
- **User Interaction**: Allow users to ask questions or seek advice about loans.

- **Response Generation**: Generate informative responses based on loan dataset and user queries.

1.4 Advantages

- Risk Reduction: Predicting loan defaults beforehand helps minimize financial risks for lenders.
- Efficient Decision-Making: Data-driven insights enable smarter choices in loan approvals, terms, and rates.
- Cost Savings: Early identification of defaults saves money on collection efforts and legal actions.
- Personalized Service: Tailoring loan offerings to individual profiles enhances customer satisfaction.
- Competitive Edge: Data-driven strategies keep lenders ahead, ensuring profitability and market leadership.

1.5 Scope

The scope of an end-to-end data project integrating ChatGPT with a loan dataset is multifaceted. Firstly, leveraging historical loan data, the project aims to develop predictive models for assessing creditworthiness and risk analysis. ChatGPT will be integrated to enhance customer interaction and support throughout the loan application process, providing personalized assistance, answering inquiries, and offering guidance tailored to individual needs. Additionally, natural language processing capabilities will facilitate sentiment analysis of customer interactions, enabling real-time monitoring of customer satisfaction and feedback. Overall, the project endeavors to streamline the loan application journey, improve customer experience, and optimize lending decisions through the synergy of data analytics and AI-driven conversational interfaces.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

2.1 Services Used

- **Data Collection:** Gather loan dataset including borrower information, loan details, and repayment history.
- **Data Preprocessing:** Clean, format, and preprocess the dataset to ensure consistency and remove noise.
- **Model Training:** Utilize ChatGPT to train a conversational AI model on the loan dataset to understand queries and provide responses.
- **Integration:** Integrate ChatGPT into the loan application system to provide end-to-end conversational support for loan inquiries and assistance.
- **Evaluation and Monitoring:** Continuously evaluate the performance of the system and monitor interactions to ensure accuracy and effectiveness in addressing user queries.

2.2 Tools and Software used

Tools:

- **Data Collection Tools**:
  Web scraping tools (e.g., BeautifulSoup, Scrapy)
  APIs for accessing financial data (e.g., Alpha Vantage, Quandl)
  Data integration platforms (e.g., Talend, Informatica)
- **Data Preprocessing Tools**:
  Data cleaning libraries (e.g., pandas, dplyr)
  Data transformation tools (e.g., Trifacta, Alteryx)
  Missing data imputation techniques (e.g., fancyimpute, scikit-learn)
- **Exploratory Data Analysis (EDA) Tools**:
  Visualization libraries (e.g., Matplotlib, Seaborn, Plotly)
  Statistical analysis tools (e.g., RStudio, Jupyter Notebooks)
  Interactive dashboard platforms (e.g., Tableau, Power BI)

- **Feature Engineering Tools**:

  Feature engineering libraries (e.g., scikit-learn, Featuretools)

  Automated feature engineering platforms (e.g., DataRobot, H2O.ai)
- **Machine Learning Tools**:

  Machine learning libraries (e.g., scikit-learn, TensorFlow, PyTorch)

  Cloud-based machine learning platforms (e.g., AWS SageMaker, Google AI Platform, Microsoft Azure Machine Learning)
- **Model Deployment and Monitoring Tools**:

  Model deployment frameworks (e.g., Flask, FastAPI)

  Model monitoring platforms (e.g., MLflow, Kubeflow)

Software Requirements:

- **Python** for scripting and data manipulation.
- **TensorFlow** or PyTorch for deep learning.
- **ChatGPT** for natural language processing.
- **Pandas** for data manipulation.
- **Flask** or Django for web deployment.

CHAPTER 3

PROJECT ARCHITECTURE

3.1 Architecture:

End to end data science project with ChatGPT:

Flow Diagram:

Data Collection > **Data Preprocessing >**

Exploratory Data Analysis > **Feature Engineering >**

Model Development > **Model Evaluation >**

Model Deployment

1. **Data Collection**: Gather loan data from various sources such as databases, APIs, and files.
2. **Data Preprocessing**: Cleanse, transform, and prepare the dataset for analysis by handling missing values, outliers, and data inconsistencies.
3. **Exploratory Data Analysis (EDA)**: Explore the dataset to understand its characteristics, patterns, and relationships.

4. **Feature Engineering**: Extract and create relevant features from the dataset to enhance predictive modeling.
5. **Model Development**: Build and train machine learning models using algorithms like logistic regression, decision trees, and XGBoost for loan default prediction.

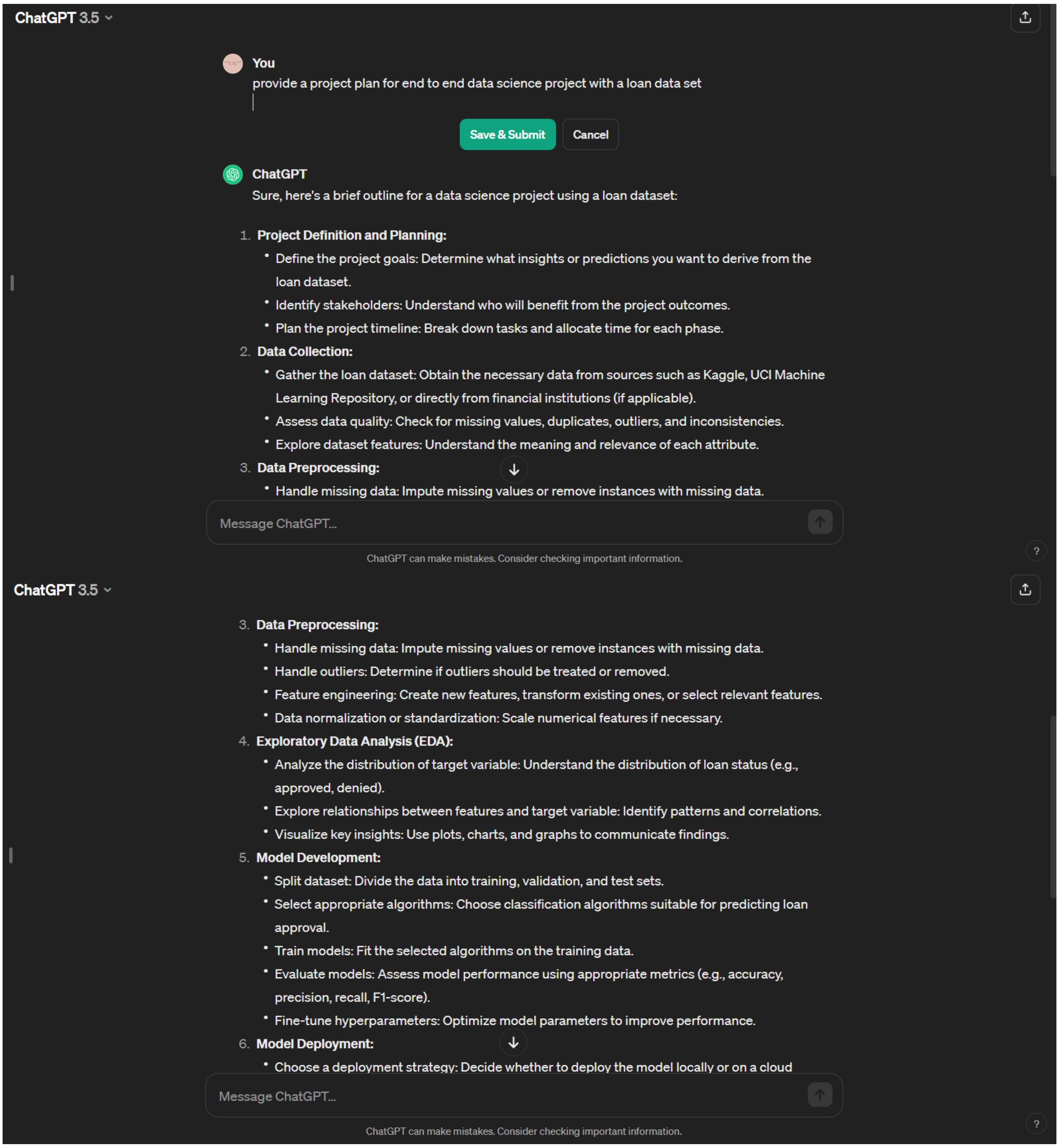
6. **Model Evaluation**: Assess the performance of the models using evaluation metrics like accuracy, precision, recall, and F1-score.

7. **Model Deployment**: Deploy the best-performing model into production for real-time predictions on new loan data.

CHAPTER 4 (code)

MODELING AND PROJECT OUTCOME

Asking chat GPT which is a AI tool to provide the project plan



You
provide a project plan for end to end data science project with a loan data set

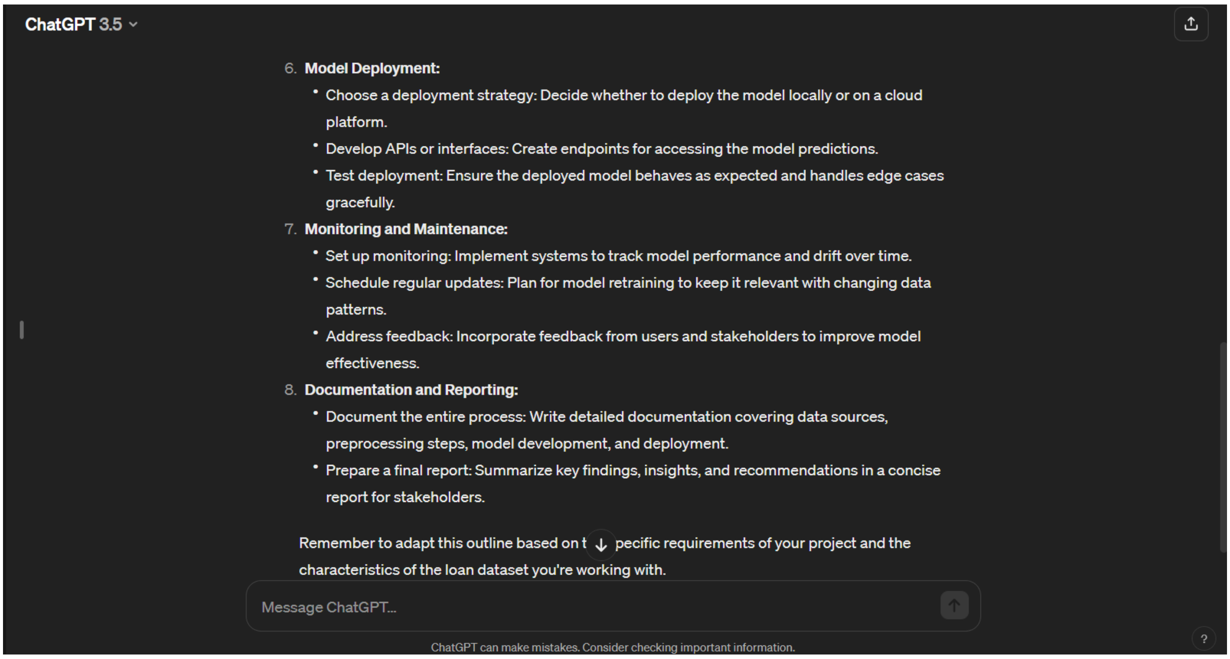
ChatGPT
Sure, here's a brief outline for a data science project using a loan dataset:

1. **Project Definition and Planning:**
   - Define the project goals: Determine what insights or predictions you want to derive from the loan dataset.
   - Identify stakeholders: Understand who will benefit from the project outcomes.
   - Plan the project timeline: Break down tasks and allocate time for each phase.
2. **Data Collection:**
   - Gather the loan dataset: Obtain the necessary data from sources such as Kaggle, UCI Machine Learning Repository, or directly from financial institutions (if applicable).
   - Assess data quality: Check for missing values, duplicates, outliers, and inconsistencies.
   - Explore dataset features: Understand the meaning and relevance of each attribute.
3. **Data Preprocessing:**
   - Handle missing data: Impute missing values or remove instances with missing data.

ChatGPT can make mistakes. Consider checking important information.

3. **Data Preprocessing:**
   - Handle missing data: Impute missing values or remove instances with missing data.
   - Handle outliers: Determine if outliers should be treated or removed.
   - Feature engineering: Create new features, transform existing ones, or select relevant features.
   - Data normalization or standardization: Scale numerical features if necessary.
4. **Exploratory Data Analysis (EDA):**
   - Analyze the distribution of target variable: Understand the distribution of loan status (e.g., approved, denied).
   - Explore relationships between features and target variable: Identify patterns and correlations.
   - Visualize key insights: Use plots, charts, and graphs to communicate findings.
5. **Model Development:**
   - Split dataset: Divide the data into training, validation, and test sets.
   - Select appropriate algorithms: Choose classification algorithms suitable for predicting loan approval.
   - Train models: Fit the selected algorithms on the training data.
   - Evaluate models: Assess model performance using appropriate metrics (e.g., accuracy, precision, recall, F1-score).
   - Fine-tune hyperparameters: Optimize model parameters to improve performance.
6. **Model Deployment:**
   - Choose a deployment strategy: Decide whether to deploy the model locally or on a cloud

ChatGPT can make mistakes. Consider checking important information.



6. **Model Deployment:**
    - Choose a deployment strategy: Decide whether to deploy the model locally or on a cloud platform.
    - Develop APIs or interfaces: Create endpoints for accessing the model predictions.
    - Test deployment: Ensure the deployed model behaves as expected and handles edge cases gracefully.
7. **Monitoring and Maintenance:**
    - Set up monitoring: Implement systems to track model performance and drift over time.
    - Schedule regular updates: Plan for model retraining to keep it relevant with changing data patterns.
    - Address feedback: Incorporate feedback from users and stakeholders to improve model effectiveness.
8. **Documentation and Reporting:**
    - Document the entire process: Write detailed documentation covering data sources, preprocessing steps, model development, and deployment.
    - Prepare a final report: Summarize key findings, insights, and recommendations in a concise report for stakeholders.

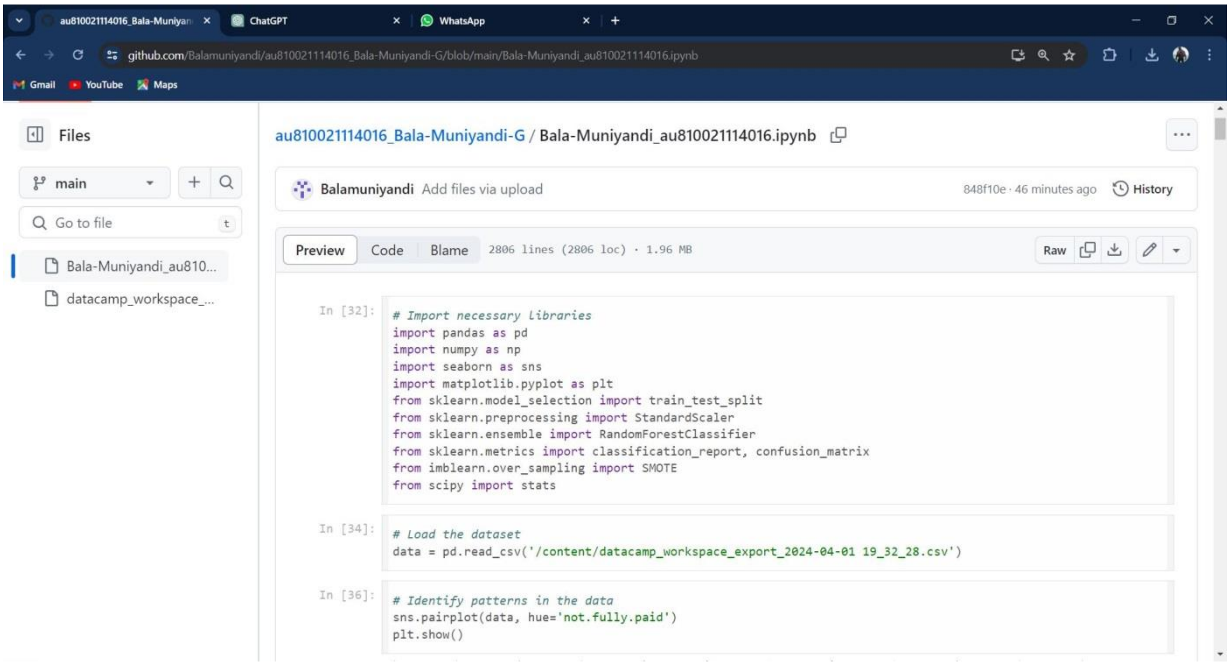
Remember to adapt this outline based on t pecific requirements of your project and the characteristics of the loan dataset you're working with.

Message ChatGPT...
ChatGPT can make mistakes. Consider checking important information.

We asked the ChatGPT “to provide the necessary codes for the project. The codes are implemented and the output is received.

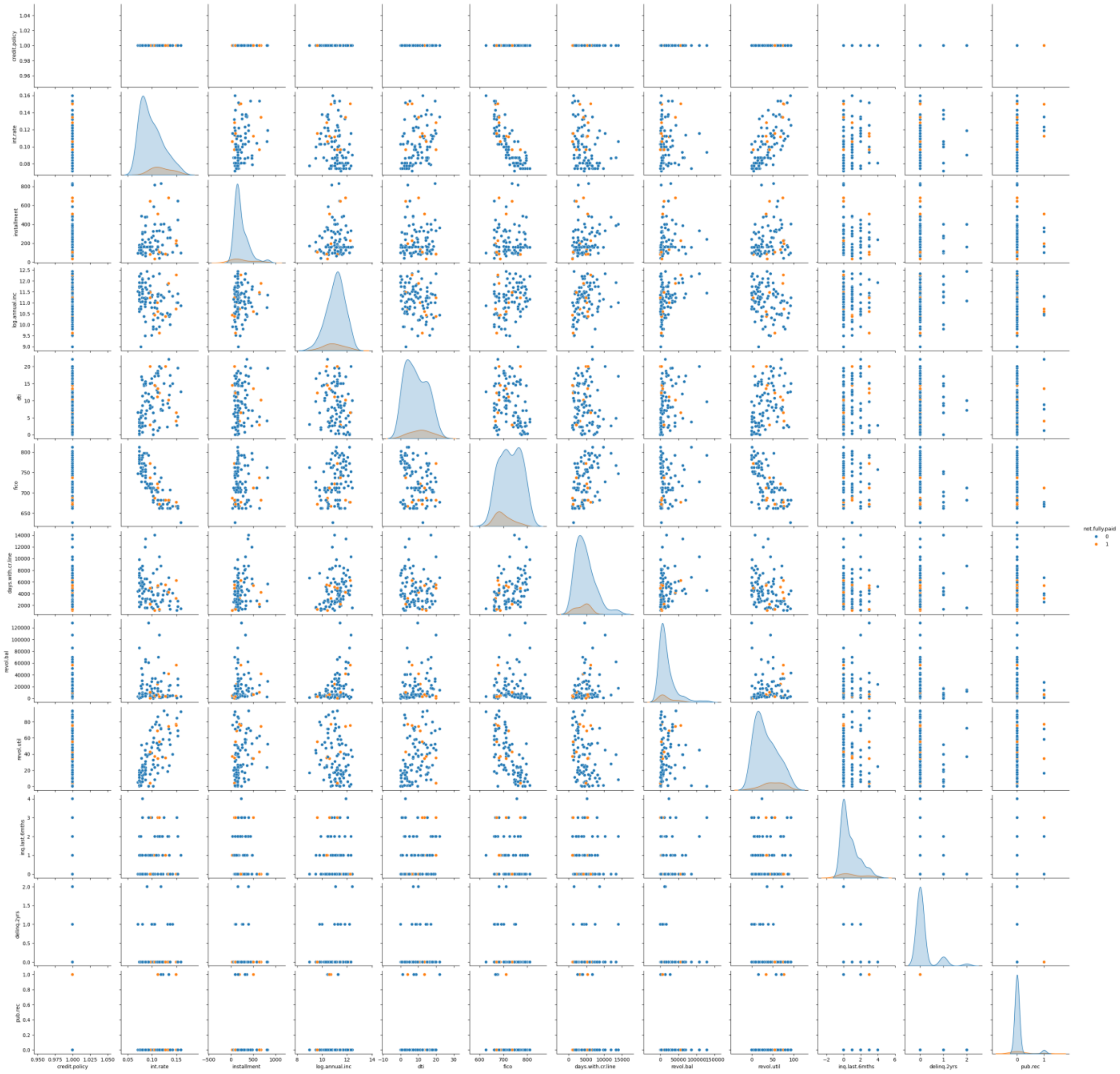
Code:

1. Data Collection
2. Data Preprocessing
3. Exploratory Data Analysis (EDA)

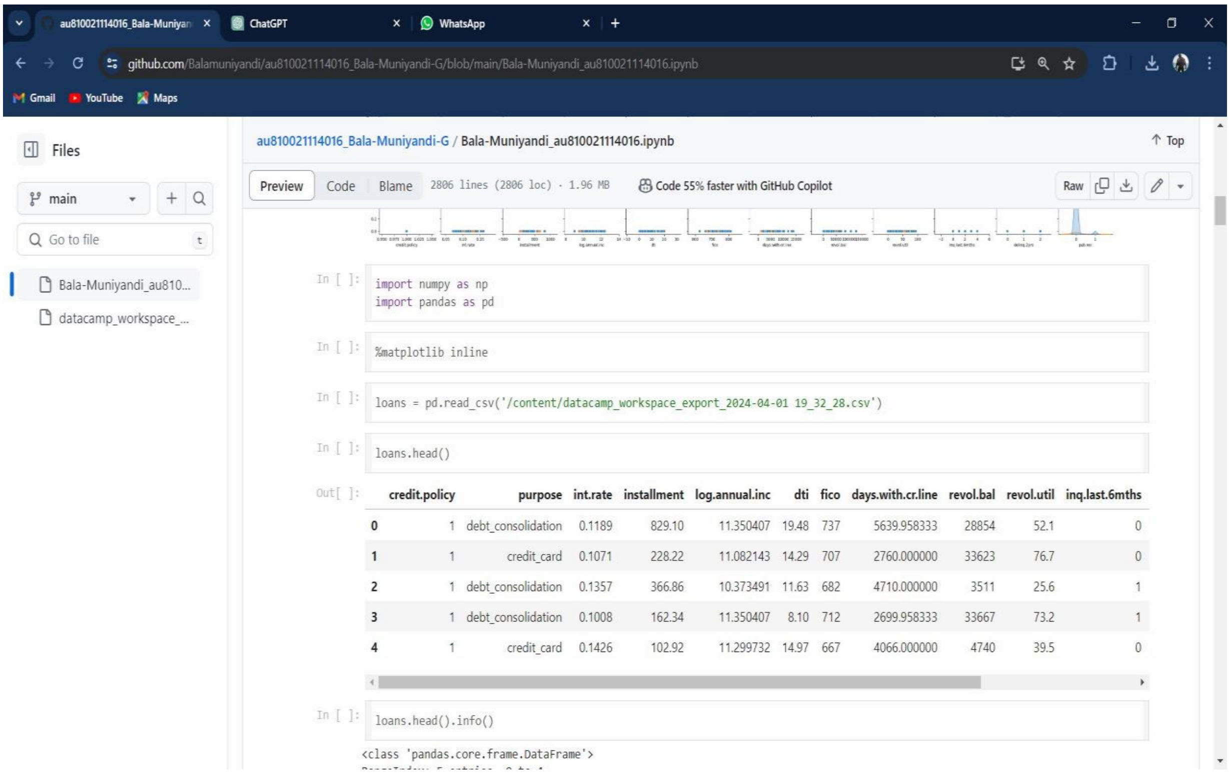

au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Balamuniyandi Add files via upload
848f10e · 46 minutes ago
History
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Raw

```
In [32]:
# Import necessary libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import classification_report, confusion_matrix
from imblearn.over_sampling import SMOTE
from scipy import stats

In [34]:
# Load the dataset
data = pd.read_csv('/content/datacamp_workspace_export_2024-04-01 19_32_28.csv')

In [36]:
# Identify patterns in the data
sns.pairplot(data, hue='not.fully.paid')
plt.show()
```

Output:



The codes and the output are screenshotted


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
In [ ]: import numpy as np
        import pandas as pd
```

```
In [ ]: %matplotlib inline
```

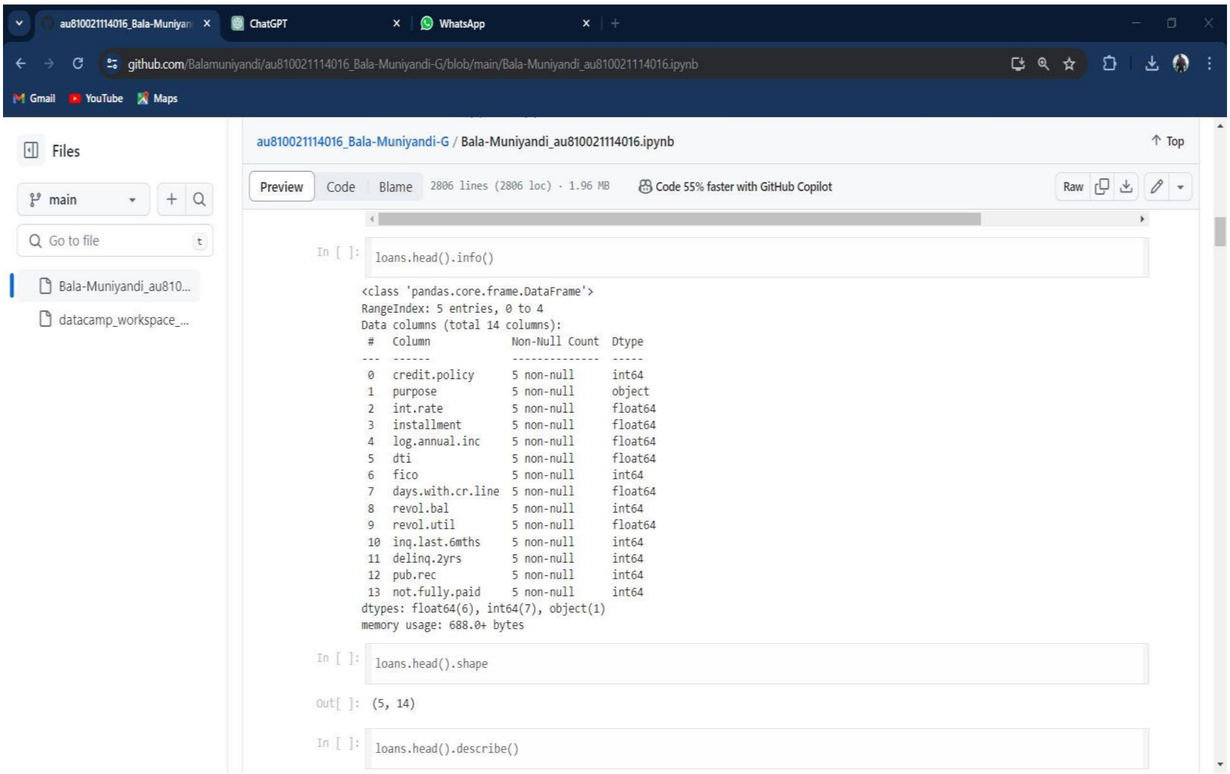
```
In [ ]: loans = pd.read_csv('/content/datacamp_workspace_export_2024-04-01 19_32_28.csv')
```

```
In [ ]: loans.head()
```

Out[ ]:

	credit.policy	purpose	int.rate	installment	log.annual.inc	dti	fico	days.with.cr.line	revol.bal	revol.util	inq.last.6mths
0	1	debt_consolidation	0.1189	829.10	11.350407	19.48	737	5639.958333	28854	52.1	0
1	1	credit_card	0.1071	228.22	11.082143	14.29	707	2760.000000	33623	76.7	0
2	1	debt_consolidation	0.1357	366.86	10.373491	11.63	682	4710.000000	3511	25.6	1
3	1	debt_consolidation	0.1008	162.34	11.350407	8.10	712	2699.958333	33667	73.2	1
4	1	credit_card	0.1426	102.92	11.299732	14.97	667	4066.000000	4740	39.5	0

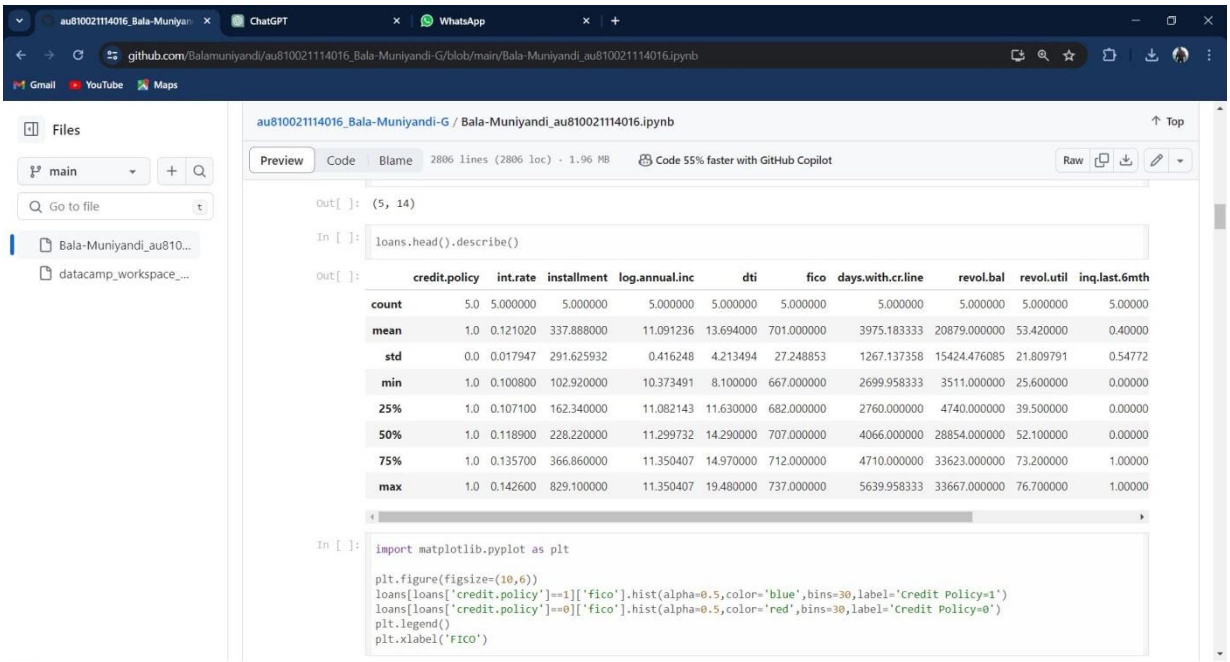
```
In [ ]: loans.head().info()

<class 'pandas.core.frame.DataFrame'>
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
In [ ]: loans.head().info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5 entries, 0 to 4
Data columns (total 14 columns):
 #   Column             Non-Null Count  Dtype  
---  ------             --------------  -----  
 0   credit.policy      5 non-null      int64  
 1   purpose            5 non-null      object 
 2   int.rate           5 non-null      float64
 3   installment        5 non-null      float64
 4   log.annual.inc     5 non-null      float64
 5   dti                5 non-null      float64
 6   fico               5 non-null      int64  
 7   days.with.cr.line  5 non-null      float64
 8   revol.bal          5 non-null      int64  
 9   revol.util         5 non-null      float64
 10  inq.last.6mths     5 non-null      int64  
 11  delinq.2yrs        5 non-null      int64  
 12  pub.rec            5 non-null      int64  
 13  not.fully.paid     5 non-null      int64  
dtypes: float64(6), int64(7), object(1)
memory usage: 688.0+ bytes
```

```
In [ ]: loans.head().shape

Out[ ]: (5, 14)
```

```
In [ ]: loans.head().describe()
```

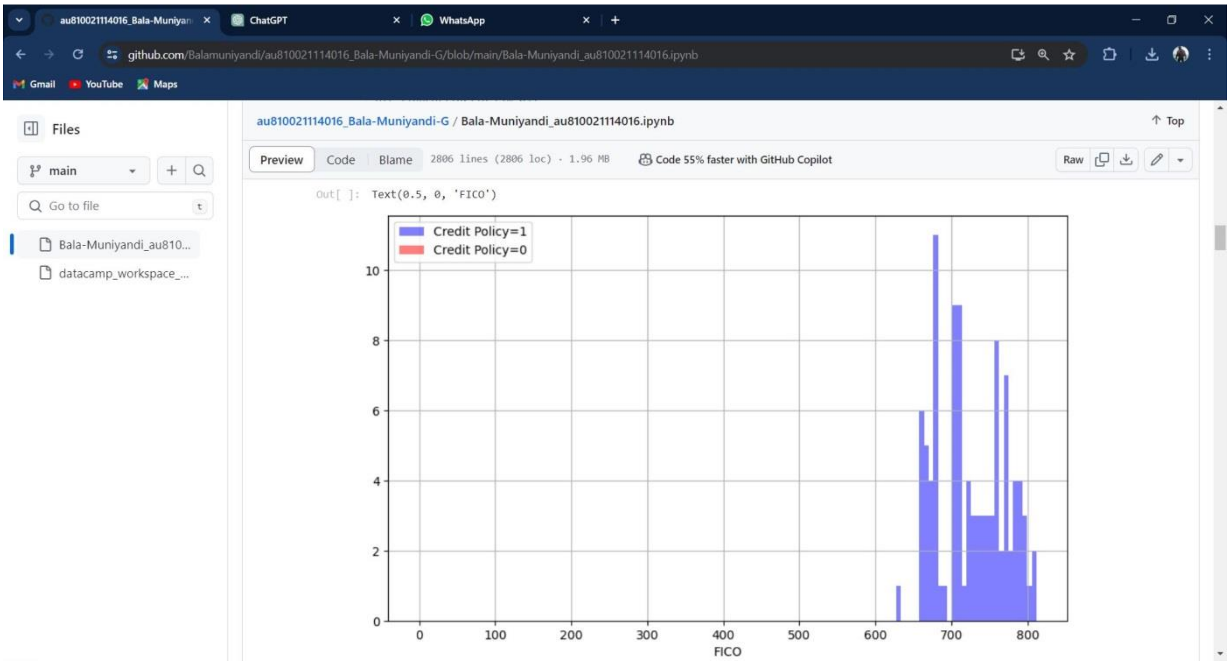

au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
Out[ ]: (5, 14)
```

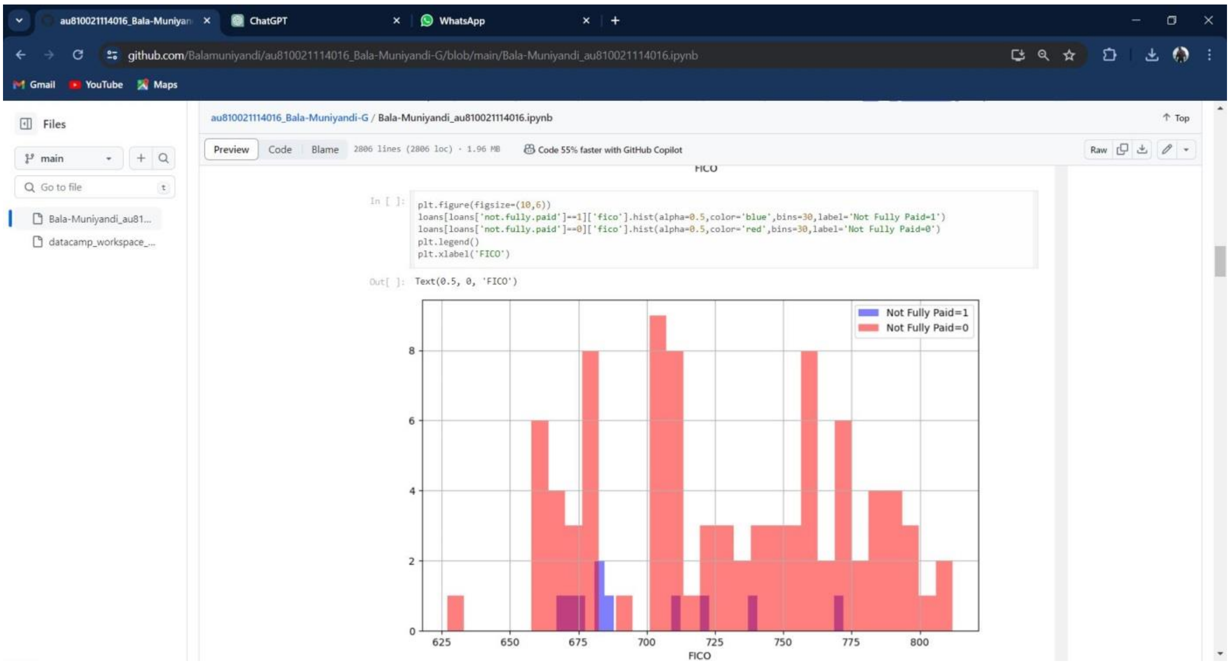
```
In [ ]: loans.head().describe()
```

```
Out[ ]:
       credit.policy  int.rate  installment  log.annual.inc        dti        fico  days.with.cr.line     revol.bal  revol.util  inq.last.6mth
count            5.0  5.000000     5.000000        5.000000   5.000000    5.000000           5.000000      5.000000    5.000000        5.00000
mean             1.0  0.121020   337.888000       11.091236  13.694000  701.000000        3975.183333  20879.000000   53.420000        0.40000
std              0.0  0.017947   291.625932        0.416248   4.213494   27.248853        1267.137358  15424.476085   21.809791        0.54772
min              1.0  0.100800   102.920000       10.373491   8.100000  667.000000        2699.958333   3511.000000   25.600000        0.00000
25%              1.0  0.107100   162.340000       11.082143  11.630000  682.000000        2760.000000   4740.000000   39.500000        0.00000
50%              1.0  0.118900   228.220000       11.299732  14.290000  707.000000        4066.000000  28854.000000   52.100000        0.00000
75%              1.0  0.135700   366.860000       11.350407  14.970000  712.000000        4710.000000  33623.000000   73.200000        1.00000
max              1.0  0.142600   829.100000       11.350407  19.480000  737.000000        5639.958333  33667.000000   76.700000        1.00000
```

```
In [ ]: import matplotlib.pyplot as plt

        plt.figure(figsize=(10,6))
        loans[loans['credit.policy']==1]['fico'].hist(alpha=0.5,color='blue',bins=30,label='Credit Policy=1')
        loans[loans['credit.policy']==0]['fico'].hist(alpha=0.5,color='red',bins=30,label='Credit Policy=0')
        plt.legend()
        plt.xlabel('FICO')
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw
🟦 Credit Policy=1
🟥 Credit Policy=0
10
8
6
4
2
0
0
100
200
300
400
500
600
700
800
FICO

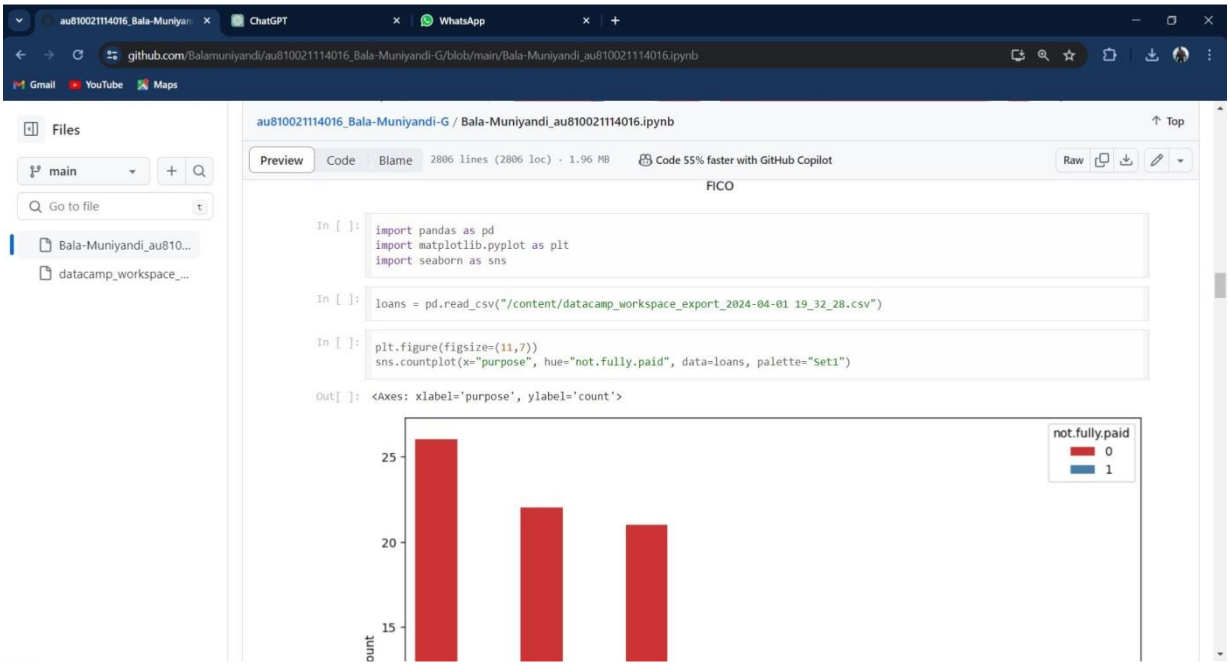
```
Out[ ]: Text(0.5, 0, 'FICO')
```



au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au81...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw
FICO

```
In [ ]: plt.figure(figsize=(10,6))
        loans[loans['not.fully.paid']==1]['fico'].hist(alpha=0.5,color='blue',bins=30,label='Not Fully Paid=1')
        loans[loans['not.fully.paid']==0]['fico'].hist(alpha=0.5,color='red',bins=30,label='Not Fully Paid=0')
        plt.legend()
        plt.xlabel('FICO')

Out[ ]: Text(0.5, 0, 'FICO')
```

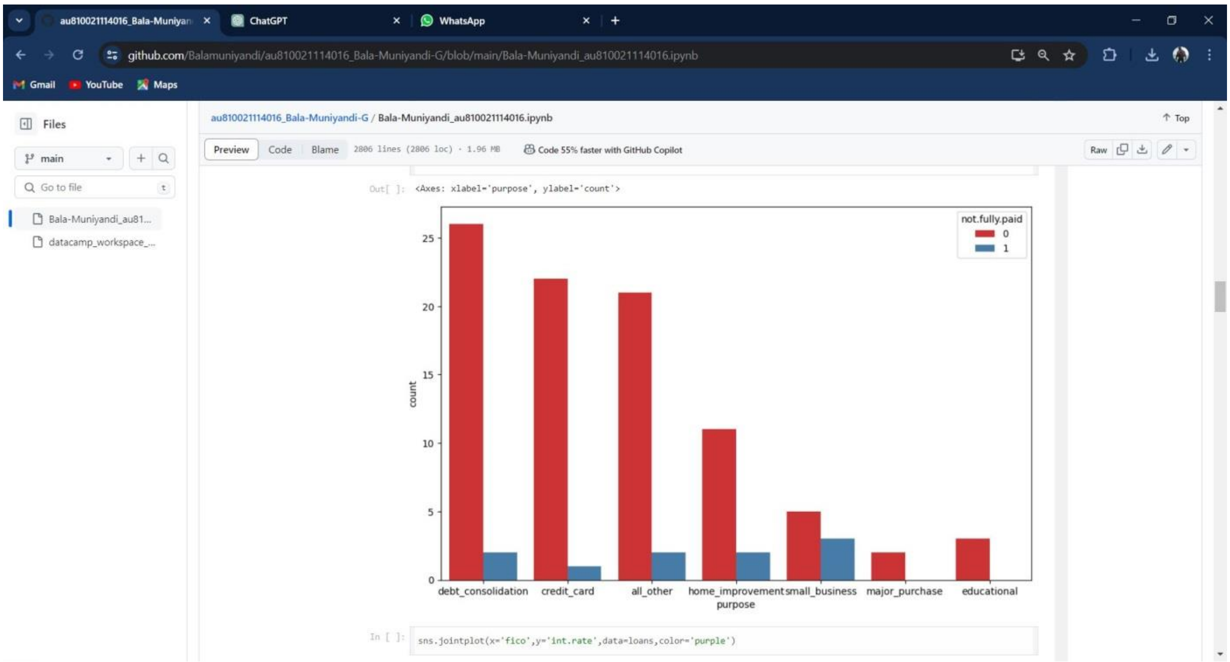
Not Fully Paid=1
Not Fully Paid=0
0
2
4
6
8
625
650
675
700
725
750
775
800
FICO



au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw
FICO

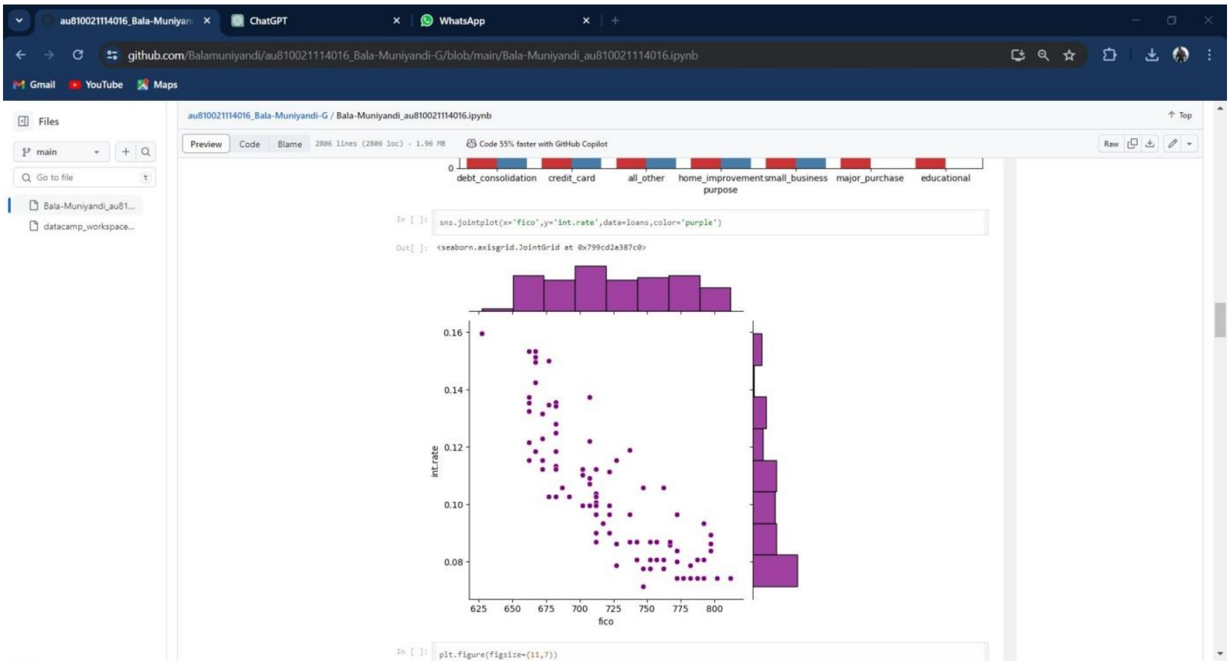
```
In [ ]: import pandas as pd
        import matplotlib.pyplot as plt
        import seaborn as sns

In [ ]: loans = pd.read_csv("/content/datacamp_workspace_export_2024-04-01 19_32_28.csv")

In [ ]: plt.figure(figsize=(11,7))
        sns.countplot(x="purpose", hue="not.fully.paid", data=loans, palette="Set1")

Out[ ]: <Axes: xlabel='purpose', ylabel='count'>
```

not.fully.paid
0
1
25
20
15
ount


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au81...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw
not.fully.paid
0
1
count
25
20
15
10
5
0
debt_consolidation
credit_card
all_other
home_improvement
small_business
major_purchase
educational
purpose

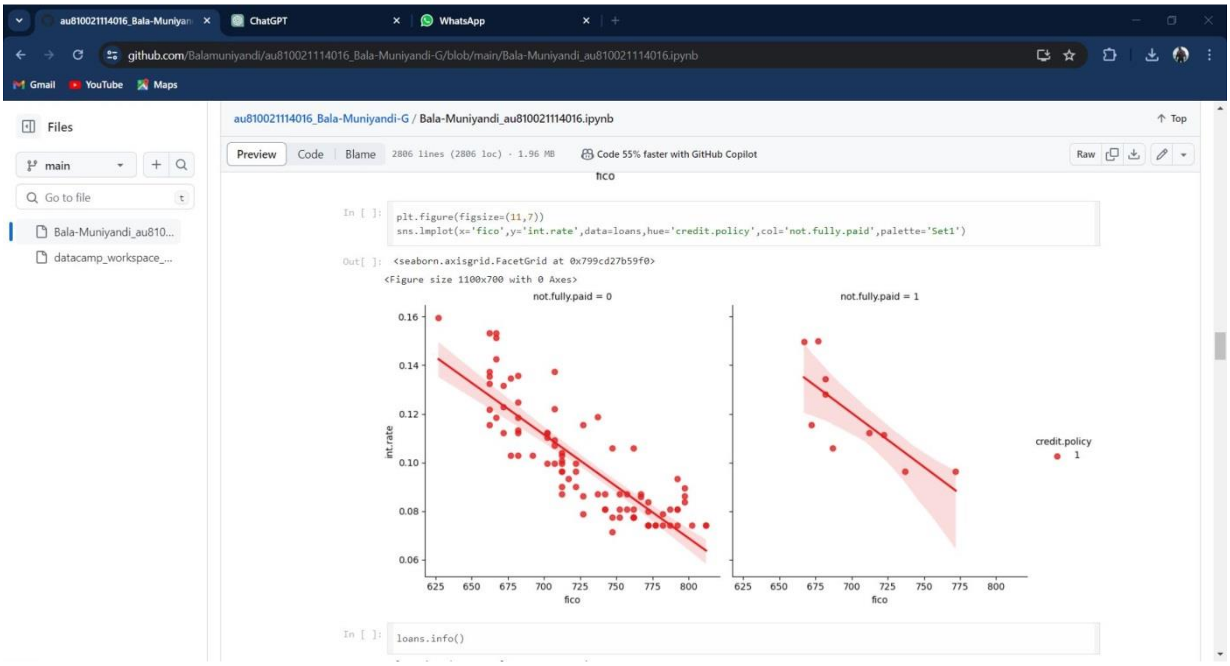
```
Out[ ]: <Axes: xlabel='purpose', ylabel='count'>
```

```
In [ ]: sns.jointplot(x='fico',y='int.rate',data=loans,color='purple')
```



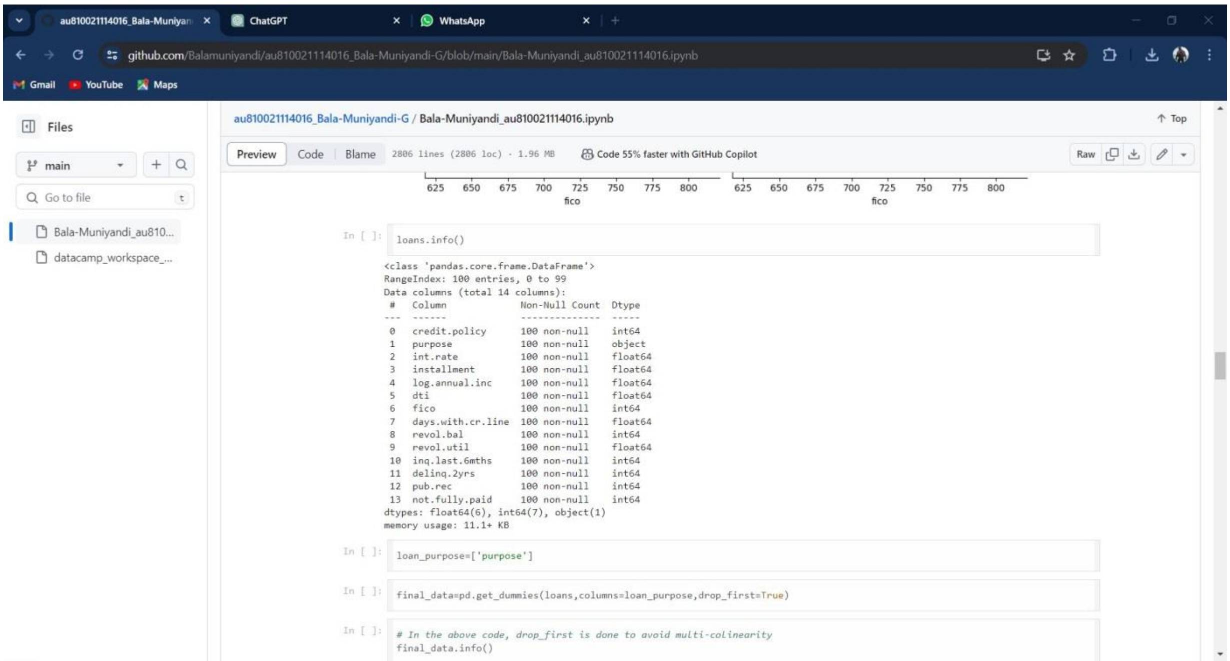
```
In [ ]: sns.jointplot(x='fico',y='int.rate',data=loans,color='purple')

Out[ ]: <seaborn.axisgrid.JointGrid at 0x799cd2a387c0>
```

```
In [ ]: plt.figure(figsize=(11,7))
```

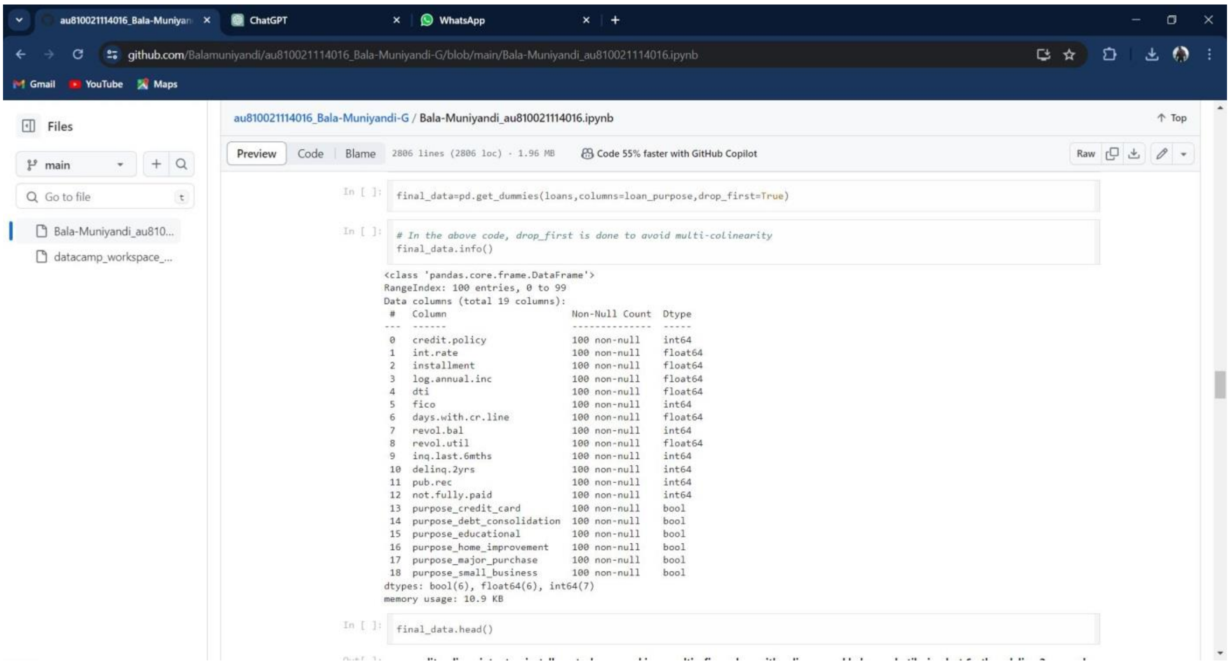

au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw
fico
not.fully.paid = 0
not.fully.paid = 1
0.16
0.14
0.12
0.10
0.08
0.06
int.rate
625
650
675
700
725
750
775
800
fico
credit.policy
● 1

```
In [ ]: plt.figure(figsize=(11,7))
        sns.lmplot(x='fico',y='int.rate',data=loans,hue='credit.policy',col='not.fully.paid',palette='Set1')

Out[ ]: <seaborn.axisgrid.FacetGrid at 0x799cd27b59f0>
<Figure size 1100x700 with 0 Axes>
```

```
In [ ]: loans.info()
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw
625
650
675
700
725
750
775
800
fico

```
In [ ]: loans.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 14 columns):
 #   Column           Non-Null Count  Dtype  
---  ------           --------------  -----  
 0   credit.policy    100 non-null    int64  
 1   purpose          100 non-null    object 
 2   int.rate         100 non-null    float64
 3   installment      100 non-null    float64
 4   log.annual.inc   100 non-null    float64
 5   dti              100 non-null    float64
 6   fico             100 non-null    int64  
 7   days.with.cr.line  100 non-null    float64
 8   revol.bal        100 non-null    int64  
 9   revol.util       100 non-null    float64
 10  inq.last.6mths   100 non-null    int64  
 11  delinq.2yrs      100 non-null    int64  
 12  pub.rec          100 non-null    int64  
 13  not.fully.paid   100 non-null    int64  
dtypes: float64(6), int64(7), object(1)
memory usage: 11.1+ KB

In [ ]: loan_purpose=['purpose']

In [ ]: final_data=pd.get_dummies(loans,columns=loan_purpose,drop_first=True)

In [ ]: # In the above code, drop_first is done to avoid multi-colinearity
        final_data.info()
```

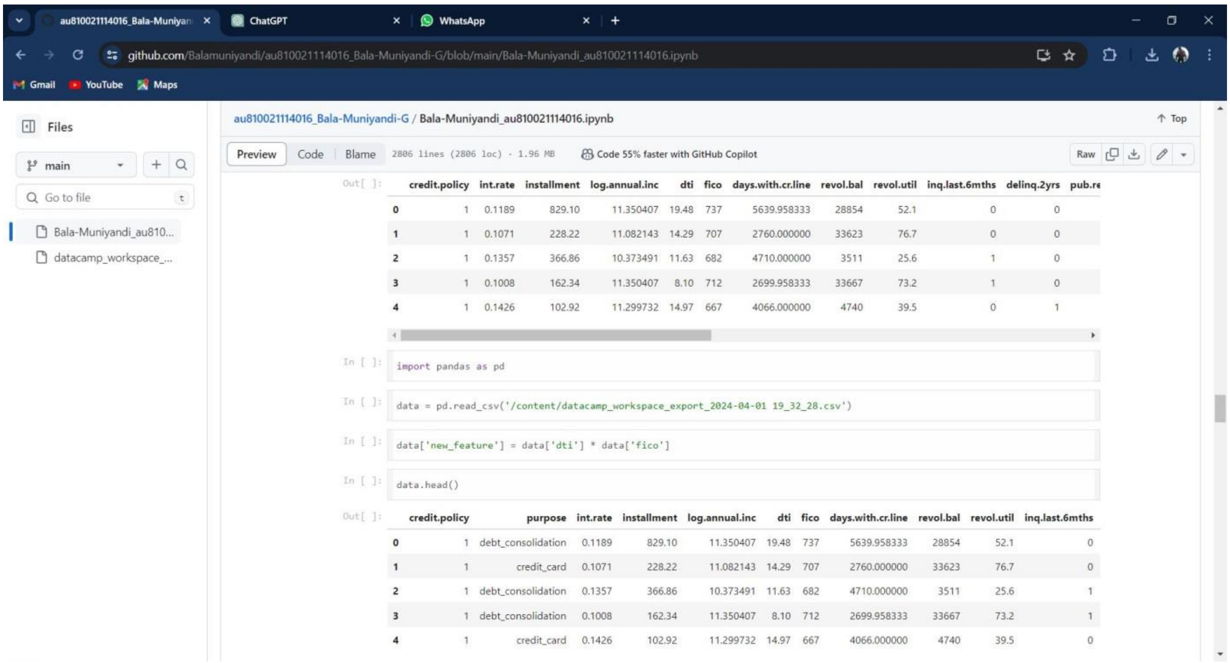

au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
In [ ]: final_data=pd.get_dummies(loans,columns=loan_purpose,drop_first=True)
```

```
In [ ]: # In the above code, drop_first is done to avoid multi-colinearity
        final_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 19 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   credit.policy               100 non-null    int64
 1   int.rate                    100 non-null    float64
 2   installment                 100 non-null    float64
 3   log.annual.inc              100 non-null    float64
 4   dti                         100 non-null    float64
 5   fico                        100 non-null    int64
 6   days.with.cr.line           100 non-null    float64
 7   revol.bal                   100 non-null    int64
 8   revol.util                  100 non-null    float64
 9   inq.last.6mths              100 non-null    int64
 10  delinq.2yrs                 100 non-null    int64
 11  pub.rec                     100 non-null    int64
 12  not.fully.paid              100 non-null    int64
 13  purpose_credit_card         100 non-null    bool
 14  purpose_debt_consolidation  100 non-null    bool
 15  purpose_educational         100 non-null    bool
 16  purpose_home_improvement    100 non-null    bool
 17  purpose_major_purchase      100 non-null    bool
 18  purpose_small_business      100 non-null    bool
dtypes: bool(6), float64(6), int64(7)
memory usage: 10.9 KB
```

```
In [ ]: final_data.head()
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

Out[ ]:

	credit.policy	int.rate	installment	log.annual.inc	dti	fico	days.with.cr.line	revol.bal	revol.util	inq.last.6mths	delinq.2yrs	pub.re
0	1	0.1189	829.10	11.350407	19.48	737	5639.958333	28854	52.1	0	0	
1	1	0.1071	228.22	11.082143	14.29	707	2760.000000	33623	76.7	0	0	
2	1	0.1357	366.86	10.373491	11.63	682	4710.000000	3511	25.6	1	0	
3	1	0.1008	162.34	11.350407	8.10	712	2699.958333	33667	73.2	1	0	
4	1	0.1426	102.92	11.299732	14.97	667	4066.000000	4740	39.5	0	1	

```
In [ ]: import pandas as pd
```

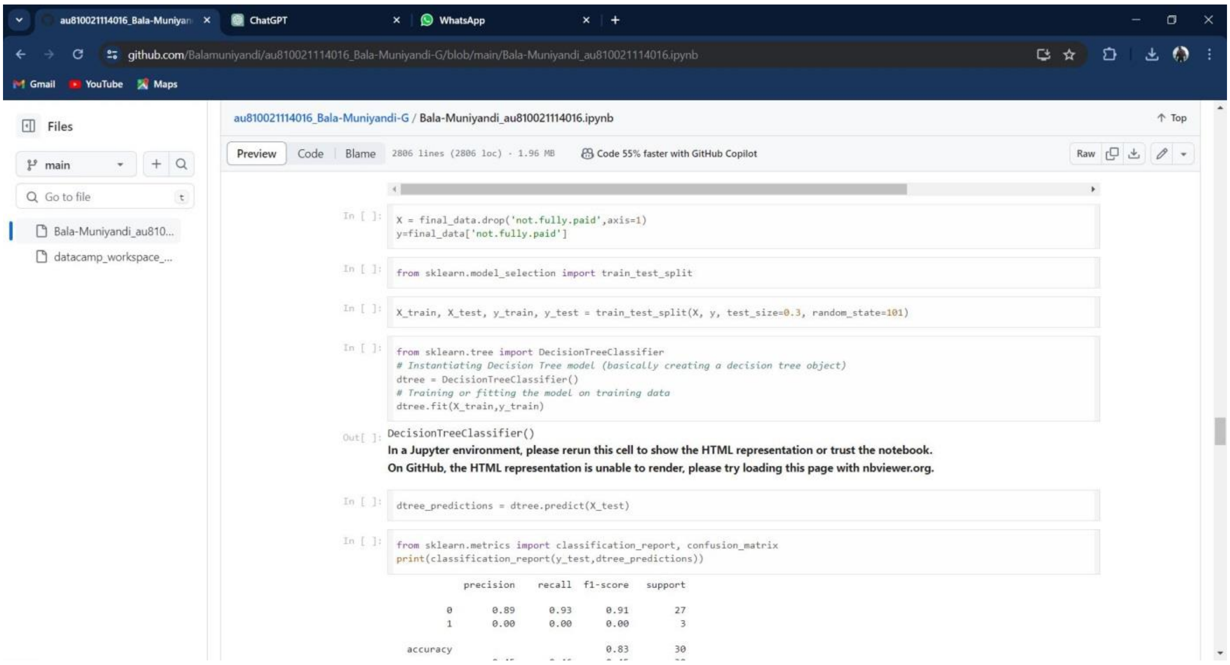
```
In [ ]: data = pd.read_csv('/content/datacamp_workspace_export_2024-04-01 19_32_28.csv')
```

```
In [ ]: data['new_feature'] = data['dti'] * data['fico']
```

```
In [ ]: data.head()
```

Out[ ]:

	credit.policy	purpose	int.rate	installment	log.annual.inc	dti	fico	days.with.cr.line	revol.bal	revol.util	inq.last.6mths
0	1	debt_consolidation	0.1189	829.10	11.350407	19.48	737	5639.958333	28854	52.1	0
1	1	credit_card	0.1071	228.22	11.082143	14.29	707	2760.000000	33623	76.7	0
2	1	debt_consolidation	0.1357	366.86	10.373491	11.63	682	4710.000000	3511	25.6	1
3	1	debt_consolidation	0.1008	162.34	11.350407	8.10	712	2699.958333	33667	73.2	1
4	1	credit_card	0.1426	102.92	11.299732	14.97	667	4066.000000	4740	39.5	0


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
In [ ]: X = final_data.drop('not.fully.paid',axis=1)
        y=final_data['not.fully.paid']
```

```
In [ ]: from sklearn.model_selection import train_test_split
```

```
In [ ]: X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=101)
```

```
In [ ]: from sklearn.tree import DecisionTreeClassifier
        # Instantiating Decision Tree model (basically creating a decision tree object)
        dtree = DecisionTreeClassifier()
        # Training or fitting the model on training data
        dtree.fit(X_train,y_train)
```

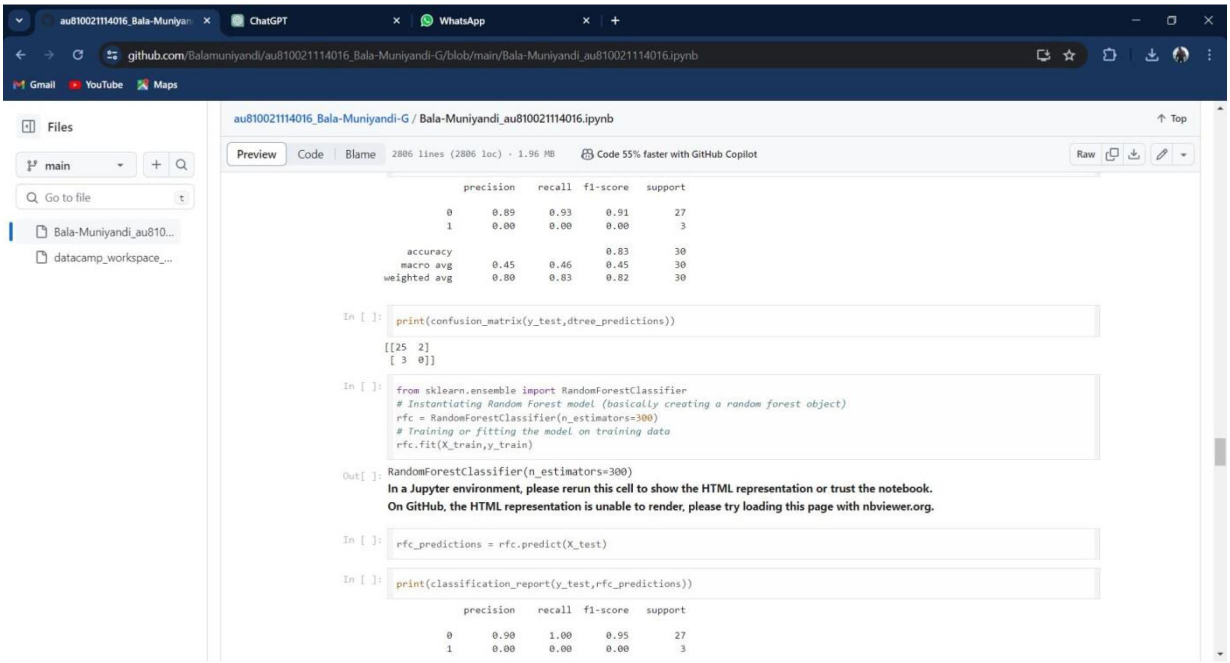
```
Out[ ]: DecisionTreeClassifier()
```

In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook.
On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.

```
In [ ]: dtree_predictions = dtree.predict(X_test)
```

```
In [ ]: from sklearn.metrics import classification_report, confusion_matrix
        print(classification_report(y_test,dtree_predictions))
```

```
              precision    recall  f1-score   support

           0       0.89      0.93      0.91        27
           1       0.00      0.00      0.00         3

    accuracy                           0.83        30
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
              precision    recall  f1-score   support

           0       0.89      0.93      0.91        27
           1       0.00      0.00      0.00         3

    accuracy                           0.83        30
   macro avg       0.45      0.46      0.45        30
weighted avg       0.80      0.83      0.82        30
```

```
In [ ]: print(confusion_matrix(y_test,dtree_predictions))
```

```
[[25  2]
 [ 3  0]]
```

```
In [ ]: from sklearn.ensemble import RandomForestClassifier
        # Instantiating Random Forest model (basically creating a random forest object)
        rfc = RandomForestClassifier(n_estimators=300)
        # Training or fitting the model on training data
        rfc.fit(X_train,y_train)
```

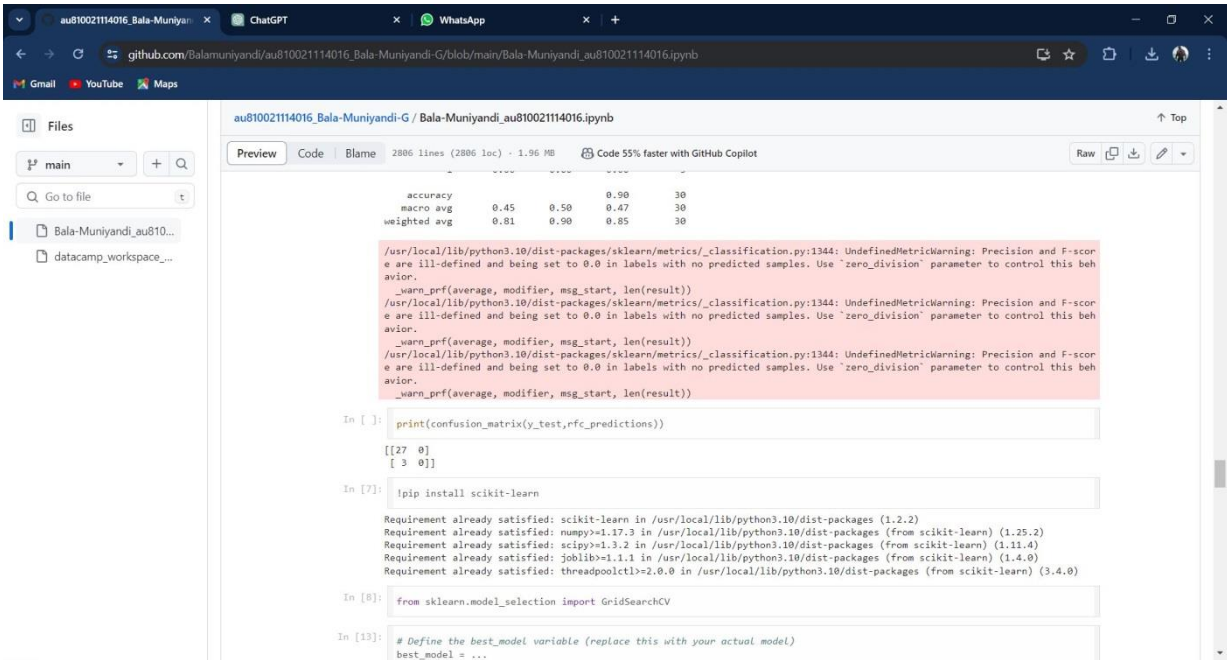
```
Out[ ]: RandomForestClassifier(n_estimators=300)
```

In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook.
On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.

```
In [ ]: rfc_predictions = rfc.predict(X_test)
```

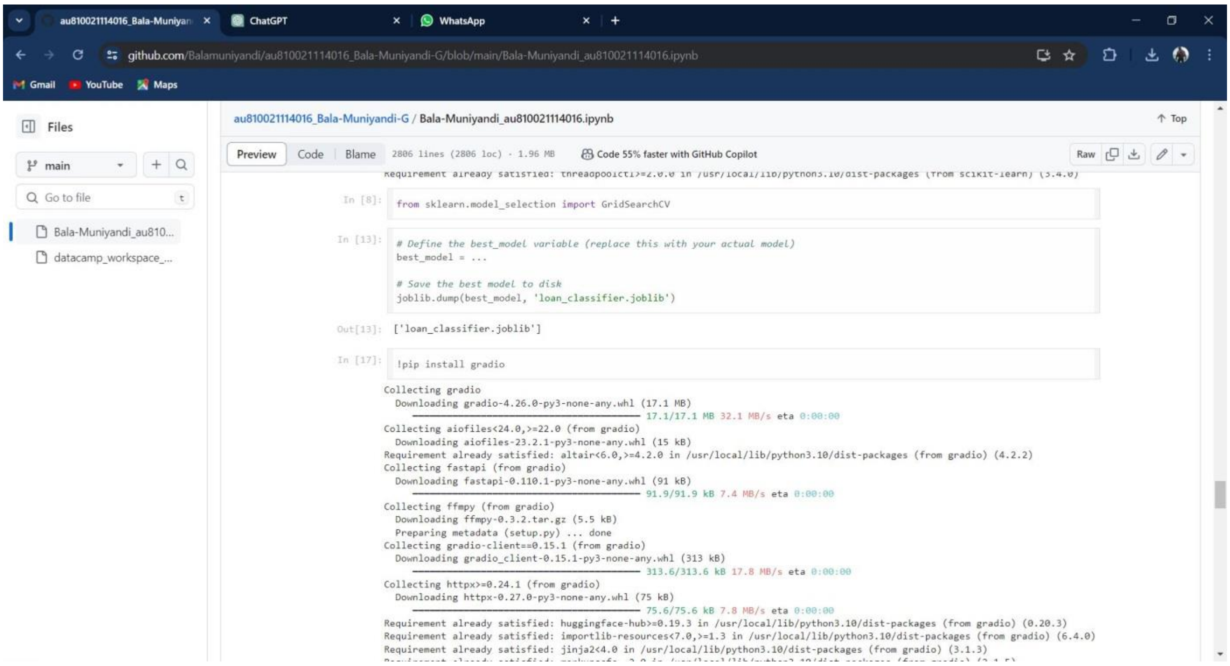
```
In [ ]: print(classification_report(y_test,rfc_predictions))
```

```
              precision    recall  f1-score   support

           0       0.90      1.00      0.95        27
           1       0.00      0.00      0.00         3
```

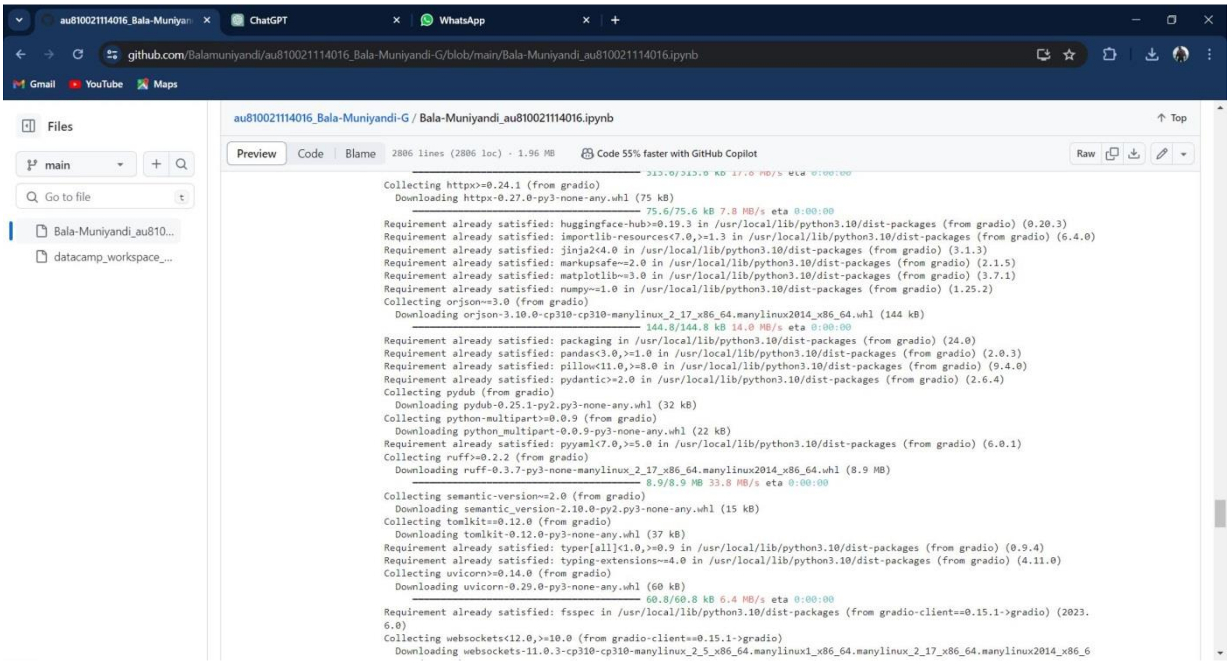

au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
    accuracy                           0.90        30
   macro avg       0.45      0.50      0.47        30
weighted avg       0.81      0.90      0.85        30

/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision and F-scor
e are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero_division` parameter to control this beh
avior.
  _warn_prf(average, modifier, msg_start, len(result))
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision and F-scor
e are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero_division` parameter to control this beh
avior.
  _warn_prf(average, modifier, msg_start, len(result))
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision and F-scor
e are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero_division` parameter to control this beh
avior.
  _warn_prf(average, modifier, msg_start, len(result))
```

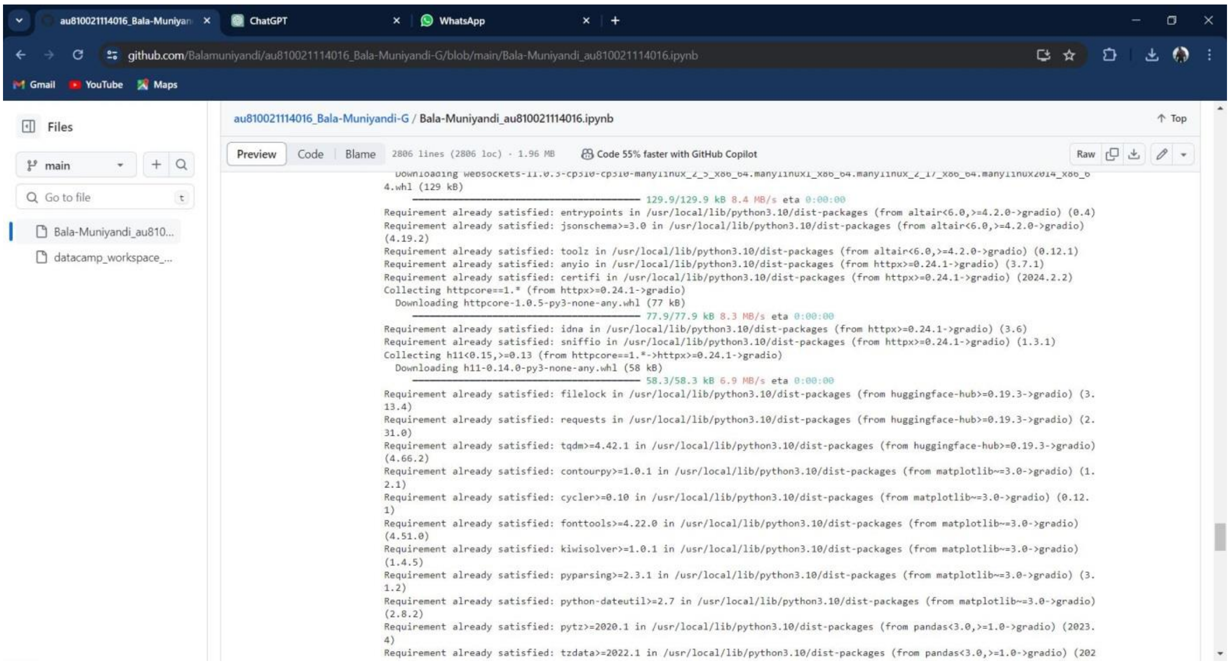
```
In [ ]:  print(confusion_matrix(y_test,rfc_predictions))

[[27  0]
 [ 3  0]]

In [7]:  !pip install scikit-learn

Requirement already satisfied: scikit-learn in /usr/local/lib/python3.10/dist-packages (1.2.2)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (1.25.2)
Requirement already satisfied: scipy>=1.3.2 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (1.11.4)
Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (1.4.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (3.4.0)

In [8]:  from sklearn.model_selection import GridSearchCV

In [13]: # Define the best_model variable (replace this with your actual model)
         best_model = ...
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

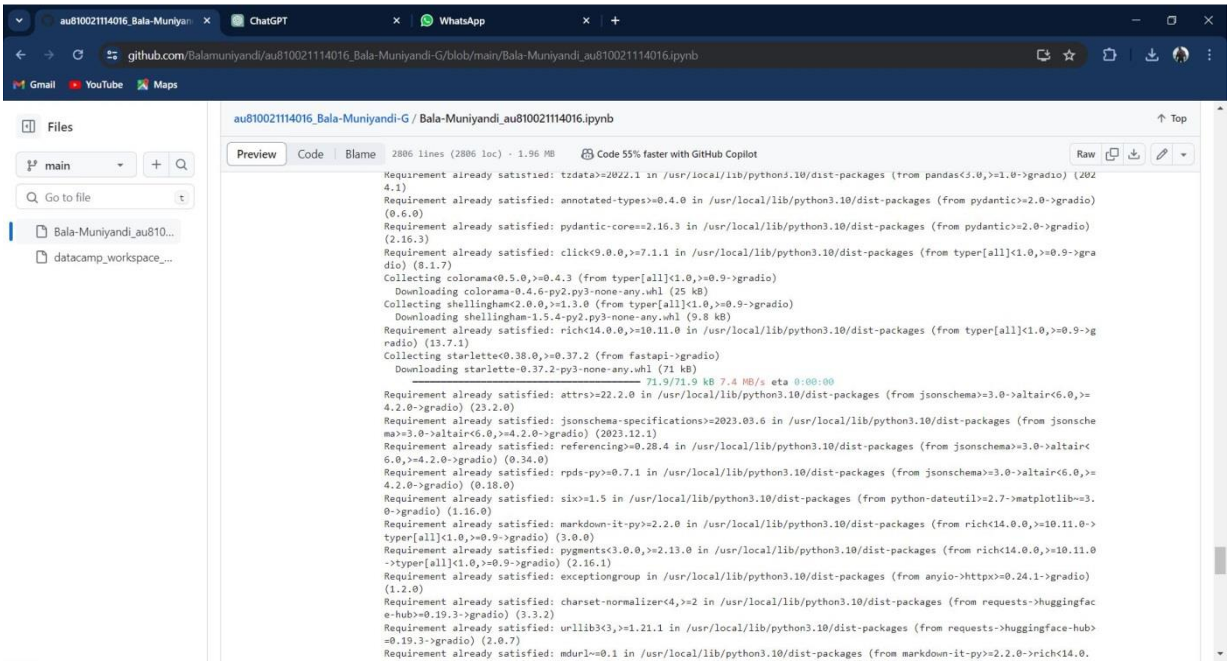
```
In [8]:  from sklearn.model_selection import GridSearchCV

In [13]: # Define the best_model variable (replace this with your actual model)
         best_model = ...

         # Save the best model to disk
         joblib.dump(best_model, 'loan_classifier.joblib')

Out[13]: ['loan_classifier.joblib']

In [17]: !pip install gradio

Collecting gradio
  Downloading gradio-4.26.0-py3-none-any.whl (17.1 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 17.1/17.1 MB 32.1 MB/s eta 0:00:00
Collecting aiofiles<24.0,>=22.0 (from gradio)
  Downloading aiofiles-23.2.1-py3-none-any.whl (15 kB)
Requirement already satisfied: altair<6.0,>=4.2.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (4.2.2)
Collecting fastapi (from gradio)
  Downloading fastapi-0.110.1-py3-none-any.whl (91 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 91.9/91.9 kB 7.4 MB/s eta 0:00:00
Collecting ffmpy (from gradio)
  Downloading ffmpy-0.3.2.tar.gz (5.5 kB)
  Preparing metadata (setup.py) ... done
Collecting gradio-client==0.15.1 (from gradio)
  Downloading gradio_client-0.15.1-py3-none-any.whl (313 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 313.6/313.6 kB 17.8 MB/s eta 0:00:00
Collecting httpx>=0.24.1 (from gradio)
  Downloading httpx-0.27.0-py3-none-any.whl (75 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 75.6/75.6 kB 7.8 MB/s eta 0:00:00
Requirement already satisfied: huggingface-hub>=0.19.3 in /usr/local/lib/python3.10/dist-packages (from gradio) (0.20.3)
Requirement already satisfied: importlib-resources<7.0,>=1.3 in /usr/local/lib/python3.10/dist-packages (from gradio) (6.4.0)
Requirement already satisfied: jinja2<4.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (3.1.3)
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

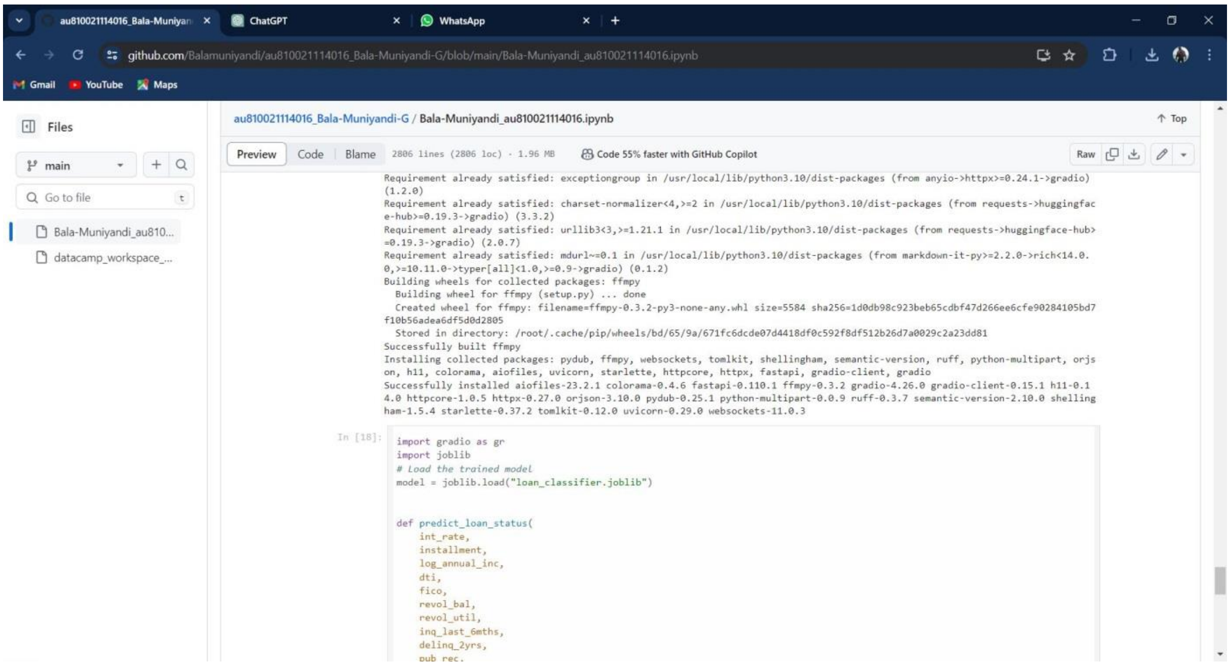
```
Collecting httpx>=0.24.1 (from gradio)
  Downloading httpx-0.27.0-py3-none-any.whl (75 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 75.6/75.6 kB 7.8 MB/s eta 0:00:00
Requirement already satisfied: huggingface-hub>=0.19.3 in /usr/local/lib/python3.10/dist-packages (from gradio) (0.20.3)
Requirement already satisfied: importlib-resources<7.0,>=1.3 in /usr/local/lib/python3.10/dist-packages (from gradio) (6.4.0)
Requirement already satisfied: jinja2<4.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (3.1.3)
Requirement already satisfied: markupsafe~=2.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (2.1.5)
Requirement already satisfied: matplotlib~=3.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (3.7.1)
Requirement already satisfied: numpy~=1.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (1.25.2)
Collecting orjson~=3.0 (from gradio)
  Downloading orjson-3.10.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (144 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 144.8/144.8 kB 14.0 MB/s eta 0:00:00
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from gradio) (24.0)
Requirement already satisfied: pandas<3.0,>=1.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (2.0.3)
Requirement already satisfied: pillow<11.0,>=8.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (9.4.0)
Requirement already satisfied: pydantic>=2.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (2.6.4)
Collecting pydub (from gradio)
  Downloading pydub-0.25.1-py2.py3-none-any.whl (32 kB)
Collecting python-multipart>=0.0.9 (from gradio)
  Downloading python_multipart-0.0.9-py3-none-any.whl (22 kB)
Requirement already satisfied: pyyaml<7.0,>=5.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (6.0.1)
Collecting ruff>=0.2.2 (from gradio)
  Downloading ruff-0.3.7-py3-none-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (8.9 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 8.9/8.9 MB 33.8 MB/s eta 0:00:00
Collecting semantic-version~=2.0 (from gradio)
  Downloading semantic_version-2.10.0-py2.py3-none-any.whl (15 kB)
Collecting tomlkit==0.12.0 (from gradio)
  Downloading tomlkit-0.12.0-py3-none-any.whl (37 kB)
Requirement already satisfied: typer[all]<1.0,>=0.9 in /usr/local/lib/python3.10/dist-packages (from gradio) (0.9.4)
Requirement already satisfied: typing-extensions~=4.0 in /usr/local/lib/python3.10/dist-packages (from gradio) (4.11.0)
Collecting uvicorn>=0.14.0 (from gradio)
  Downloading uvicorn-0.29.0-py3-none-any.whl (60 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 60.8/60.8 kB 6.4 MB/s eta 0:00:00
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-packages (from gradio-client==0.15.1->gradio) (2023.
6.0)
Collecting websockets<12.0,>=10.0 (from gradio-client==0.15.1->gradio)
  Downloading websockets-11.0.3-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_6
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
4.whl (129 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 129.9/129.9 kB 8.4 MB/s eta 0:00:00
Requirement already satisfied: entrypoints in /usr/local/lib/python3.10/dist-packages (from altair<6.0,>=4.2.0->gradio) (0.4)
Requirement already satisfied: jsonschema>=3.0 in /usr/local/lib/python3.10/dist-packages (from altair<6.0,>=4.2.0->gradio)
(4.19.2)
Requirement already satisfied: toolz in /usr/local/lib/python3.10/dist-packages (from altair<6.0,>=4.2.0->gradio) (0.12.1)
Requirement already satisfied: anyio in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (3.7.1)
Requirement already satisfied: certifi in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (2024.2.2)
Collecting httpcore==1.* (from httpx>=0.24.1->gradio)
  Downloading httpcore-1.0.5-py3-none-any.whl (77 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 77.9/77.9 kB 8.3 MB/s eta 0:00:00
Requirement already satisfied: idna in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (3.6)
Requirement already satisfied: sniffio in /usr/local/lib/python3.10/dist-packages (from httpx>=0.24.1->gradio) (1.3.1)
Collecting h11<0.15,>=0.13 (from httpcore==1.*->httpx>=0.24.1->gradio)
  Downloading h11-0.14.0-py3-none-any.whl (58 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 58.3/58.3 kB 6.9 MB/s eta 0:00:00
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.19.3->gradio) (3.
13.4)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.19.3->gradio) (2.
31.0)
Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.19.3->gradio)
(4.66.2)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (1.
2.1)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (0.12.
1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio)
(4.51.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio)
(1.4.5)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio) (3.
1.2)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib~=3.0->gradio)
(2.8.2)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas<3.0,>=1.0->gradio) (2023.
4)
Requirement already satisfied: tzdata>=2022.1 in /usr/local/lib/python3.10/dist-packages (from pandas<3.0,>=1.0->gradio) (202
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

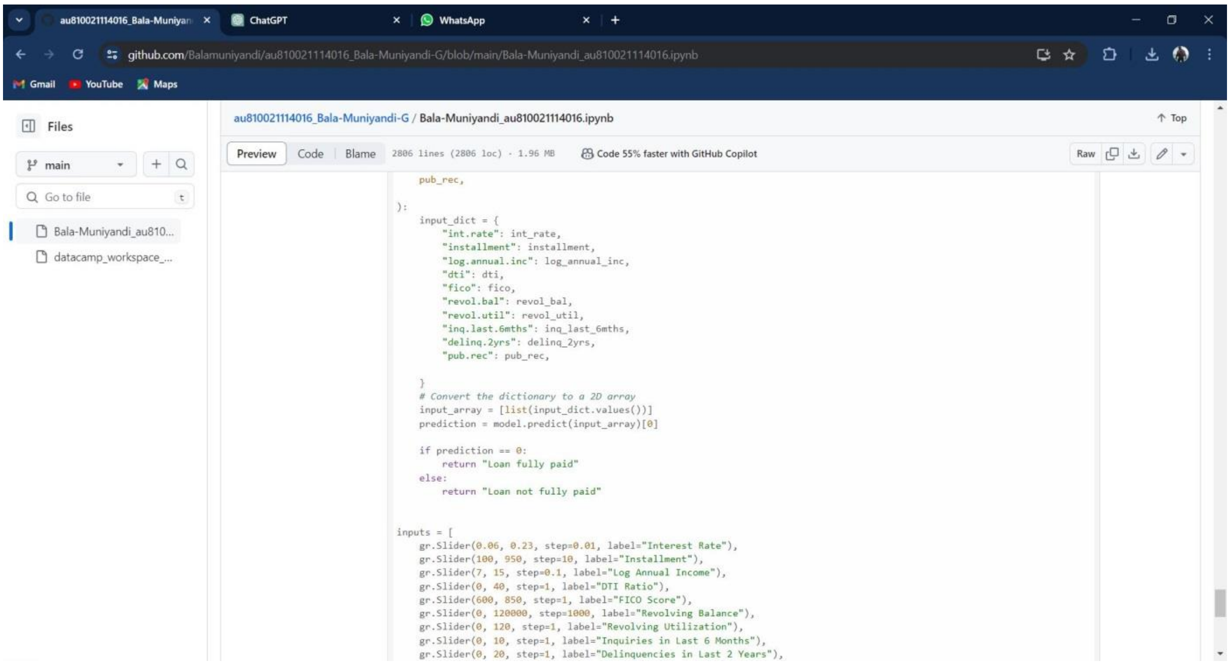
```
Requirement already satisfied: tzdata>=2022.1 in /usr/local/lib/python3.10/dist-packages (from pandas<3.0,>=1.0->gradio) (202
4.1)
Requirement already satisfied: annotated-types>=0.4.0 in /usr/local/lib/python3.10/dist-packages (from pydantic>=2.0->gradio)
(0.6.0)
Requirement already satisfied: pydantic-core==2.16.3 in /usr/local/lib/python3.10/dist-packages (from pydantic>=2.0->gradio)
(2.16.3)
Requirement already satisfied: click<9.0.0,>=7.1.1 in /usr/local/lib/python3.10/dist-packages (from typer[all]<1.0,>=0.9->gra
dio) (8.1.7)
Collecting colorama<0.5.0,>=0.4.3 (from typer[all]<1.0,>=0.9->gradio)
  Downloading colorama-0.4.6-py2.py3-none-any.whl (25 kB)
Collecting shellingham<2.0.0,>=1.3.0 (from typer[all]<1.0,>=0.9->gradio)
  Downloading shellingham-1.5.4-py2.py3-none-any.whl (9.8 kB)
Requirement already satisfied: rich<14.0.0,>=10.11.0 in /usr/local/lib/python3.10/dist-packages (from typer[all]<1.0,>=0.9->g
radio) (13.7.1)
Collecting starlette<0.38.0,>=0.37.2 (from fastapi->gradio)
  Downloading starlette-0.37.2-py3-none-any.whl (71 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 71.9/71.9 kB 7.4 MB/s eta 0:00:00
Requirement already satisfied: attrs>=22.2.0 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<6.0,>=
4.2.0->gradio) (23.2.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /usr/local/lib/python3.10/dist-packages (from jsonsche
ma>=3.0->altair<6.0,>=4.2.0->gradio) (2023.12.1)
Requirement already satisfied: referencing>=0.28.4 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<
6.0,>=4.2.0->gradio) (0.34.0)
Requirement already satisfied: rpds-py>=0.7.1 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=3.0->altair<6.0,>=
4.2.0->gradio) (0.18.0)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib~=3.
0->gradio) (1.16.0)
Requirement already satisfied: markdown-it-py>=2.2.0 in /usr/local/lib/python3.10/dist-packages (from rich<14.0.0,>=10.11.0->
typer[all]<1.0,>=0.9->gradio) (3.0.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in /usr/local/lib/python3.10/dist-packages (from rich<14.0.0,>=10.11.0
->typer[all]<1.0,>=0.9->gradio) (2.16.1)
Requirement already satisfied: exceptiongroup in /usr/local/lib/python3.10/dist-packages (from anyio->httpx>=0.24.1->gradio)
(1.2.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->huggingfac
e-hub>=0.19.3->gradio) (3.3.2)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub>
=0.19.3->gradio) (2.0.7)
Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.10/dist-packages (from markdown-it-py>=2.2.0->rich<14.0.
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

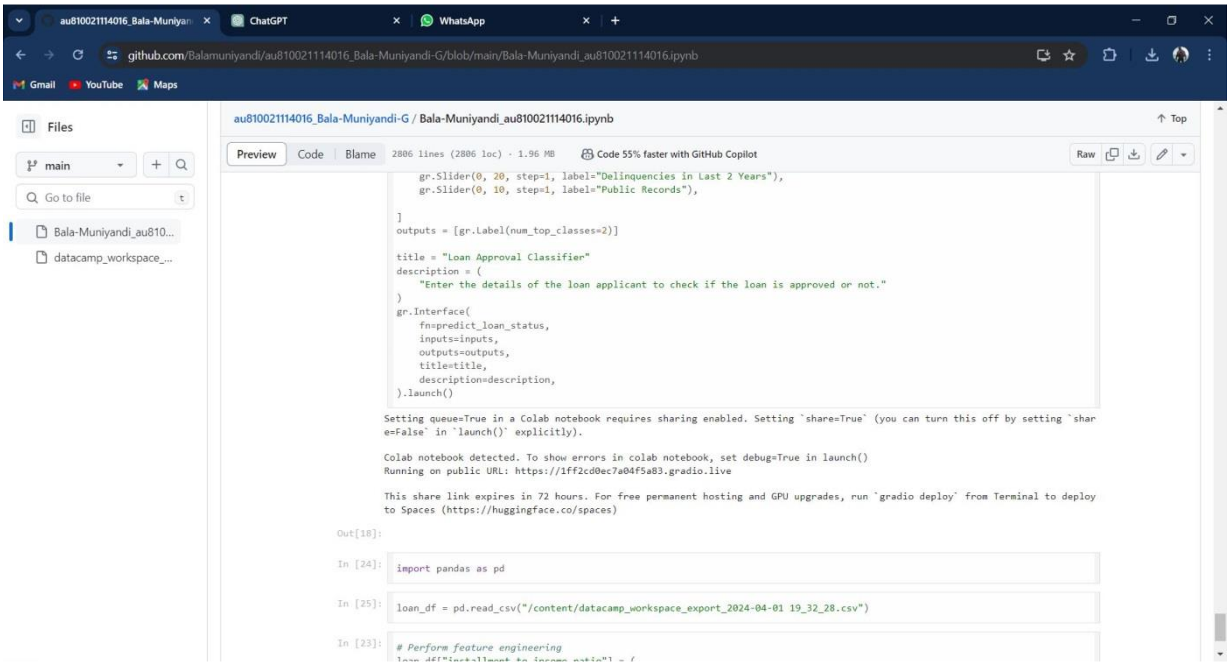
```
Requirement already satisfied: exceptiongroup in /usr/local/lib/python3.10/dist-packages (from anyio->httpx>=0.24.1->gradio)
(1.2.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->huggingfac
e-hub>=0.19.3->gradio) (3.3.2)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub>
=0.19.3->gradio) (2.0.7)
Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.10/dist-packages (from markdown-it-py>=2.2.0->rich<14.0.
0,>=10.11.0->typer[all]<1.0,>=0.9->gradio) (0.1.2)
Building wheels for collected packages: ffmpy
  Building wheel for ffmpy (setup.py) ... done
  Created wheel for ffmpy: filename=ffmpy-0.3.2-py3-none-any.whl size=5584 sha256=1d0db98c923beb65cdbf47d266ee6cfe90284105bd7
f10b56adea6df5d0d2805
  Stored in directory: /root/.cache/pip/wheels/bd/65/9a/671fc6dcde07d4418df0c592f8df512b26d7a0029c2a23dd81
Successfully built ffmpy
Installing collected packages: pydub, ffmpy, websockets, tomlkit, shellingham, semantic-version, ruff, python-multipart, orjs
on, h11, colorama, aiofiles, uvicorn, starlette, httpcore, httpx, fastapi, gradio-client, gradio
Successfully installed aiofiles-23.2.1 colorama-0.4.6 fastapi-0.110.1 ffmpy-0.3.2 gradio-4.26.0 gradio-client-0.15.1 h11-0.1
4.0 httpcore-1.0.5 httpx-0.27.0 orjson-3.10.0 pydub-0.25.1 python-multipart-0.0.9 ruff-0.3.7 semantic-version-2.10.0 shelling
ham-1.5.4 starlette-0.37.2 tomlkit-0.12.0 uvicorn-0.29.0 websockets-11.0.3
```

In [18]:

```
import gradio as gr
import joblib
# Load the trained model
model = joblib.load("loan_classifier.joblib")


def predict_loan_status(
    int_rate,
    installment,
    log_annual_inc,
    dti,
    fico,
    revol_bal,
    revol_util,
    inq_last_6mths,
    delinq_2yrs,
    pub_rec,
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
    pub_rec,

):
    input_dict = {
        "int.rate": int_rate,
        "installment": installment,
        "log.annual.inc": log_annual_inc,
        "dti": dti,
        "fico": fico,
        "revol.bal": revol_bal,
        "revol.util": revol_util,
        "inq.last.6mths": inq_last_6mths,
        "delinq.2yrs": delinq_2yrs,
        "pub.rec": pub_rec,

    }
    # Convert the dictionary to a 2D array
    input_array = [list(input_dict.values())]
    prediction = model.predict(input_array)[0]

    if prediction == 0:
        return "Loan fully paid"
    else:
        return "Loan not fully paid"


inputs = [
    gr.Slider(0.06, 0.23, step=0.01, label="Interest Rate"),
    gr.Slider(100, 950, step=10, label="Installment"),
    gr.Slider(7, 15, step=0.1, label="Log Annual Income"),
    gr.Slider(0, 40, step=1, label="DTI Ratio"),
    gr.Slider(600, 850, step=1, label="FICO Score"),
    gr.Slider(0, 120000, step=1000, label="Revolving Balance"),
    gr.Slider(0, 120, step=1, label="Revolving Utilization"),
    gr.Slider(0, 10, step=1, label="Inquiries in Last 6 Months"),
    gr.Slider(0, 20, step=1, label="Delinquencies in Last 2 Years"),
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
    gr.Slider(0, 20, step=1, label="Delinquencies in Last 2 Years"),
    gr.Slider(0, 10, step=1, label="Public Records"),

]
outputs = [gr.Label(num_top_classes=2)]

title = "Loan Approval Classifier"
description = (
    "Enter the details of the loan applicant to check if the loan is approved or not."
)
gr.Interface(
    fn=predict_loan_status,
    inputs=inputs,
    outputs=outputs,
    title=title,
    description=description,
).launch()
```

```
Setting queue=True in a Colab notebook requires sharing enabled. Setting `share=True` (you can turn this off by setting `shar
e=False` in `launch()` explicitly).

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()
Running on public URL: https://1ff2cd0ec7a04f5a83.gradio.live

This share link expires in 72 hours. For free permanent hosting and GPU upgrades, run `gradio deploy` from Terminal to deploy
to Spaces (https://huggingface.co/spaces)
```

Out[18]:

In [24]:

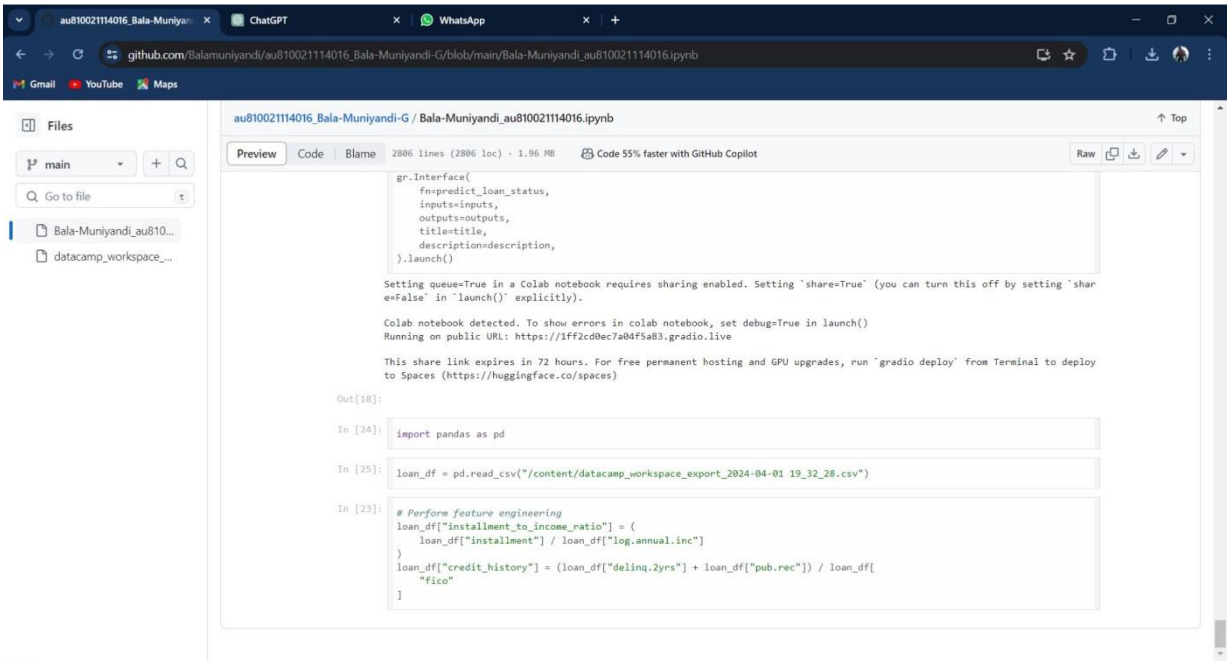
```
import pandas as pd
```

In [25]:

```
loan_df = pd.read_csv("/content/datacamp_workspace_export_2024-04-01 19_32_28.csv")
```

In [23]:

```
# Perform feature engineering
```


au810021114016_Bala-Muniyan
ChatGPT
WhatsApp
github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G/blob/main/Bala-Muniyandi_au810021114016.ipynb
Gmail
YouTube
Maps
Files
main
Go to file
Bala-Muniyandi_au810...
datacamp_workspace_...
au810021114016_Bala-Muniyandi-G / Bala-Muniyandi_au810021114016.ipynb
Top
Preview
Code
Blame
2806 lines (2806 loc) · 1.96 MB
Code 55% faster with GitHub Copilot
Raw

```
gr.Interface(
    fn=predict_loan_status,
    inputs=inputs,
    outputs=outputs,
    title=title,
    description=description,
).launch()
```

```
Setting queue=True in a Colab notebook requires sharing enabled. Setting `share=True` (you can turn this off by setting `shar
e=False` in `launch()` explicitly).

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()
Running on public URL: https://1ff2cd0ec7a04f5a83.gradio.live

This share link expires in 72 hours. For free permanent hosting and GPU upgrades, run `gradio deploy` from Terminal to deploy
to Spaces (https://huggingface.co/spaces)
```

Out[18]:

In [24]:

```
import pandas as pd
```

In [25]:

```
loan_df = pd.read_csv("/content/datacamp_workspace_export_2024-04-01 19_32_28.csv")
```

In [23]:

```
# Perform feature engineering
loan_df["installment_to_income_ratio"] = (
    loan_df["installment"] / loan_df["log.annual.inc"]
)
loan_df["credit_history"] = (loan_df["delinq.2yrs"] + loan_df["pub.rec"]) / loan_df[
    "fico"
]
```

APP INTERFERENCE/ PROJECT RESULT

The end-to-end data science project resulted in the creation of an interactive chatbot that provides personalized loan eligibility predictions based on user input. Users can easily access this service through various messaging platforms, making it convenient and user-friendly. The integration of ChatGPT enhances the user experience by providing a conversational interface, making the process intuitive and accessible to a wider audience. Overall, the project demonstrates the potential of combining machine learning with natural language processing for practical applications like financial services.

CONCLUSION

In conclusion, the implementation of an end-to-end data project utilizing ChatGPT for a loan dataset offers a robust solution for enhancing customer engagement and service efficiency in the lending domain. By leveraging natural language processing capabilities, this project enables seamless communication between users and the loan application system, providing instant assistance and guidance throughout the loan application process. Through meticulous data preprocessing, model training, integration, and deployment, this project ensures the delivery of accurate and relevant responses to user queries, ultimately facilitating a streamlined and user-friendly experience. With continuous monitoring and updates, this system remains adaptive and responsive to evolving user needs, thereby maximizing its effectiveness in serving borrowers and optimizing loan management processes.

FUTURE SCOPE

Looking ahead, the future scope for an end-to-end data project utilizing ChatGPT for a loan dataset is promising and multifaceted. Advancements in natural language processing and machine learning techniques will enable the development of even more sophisticated and personalized loan application systems. Integration of additional data sources, such as social media profiles or financial transaction history, could enrich the model's understanding of borrower preferences and risk profiles, leading to more accurate loan decisions. Furthermore, incorporating voice recognition capabilities could enhance user accessibility and convenience, catering to a broader range of users. Collaboration with financial institutions and regulatory bodies may foster the adoption of standardized processes and compliance measures within the system, ensuring trust and reliability. Ultimately, the future holds immense potential for leveraging ChatGPT in loan management, driving innovation, and improving financial inclusion for individuals and businesses alike.

REFERENCES

1. Project Github link, Ramar Bose , 2024
2. Project video recorded link (youtube/github), Ramar Bose , 2024
3. Project PPT & Report github link, Ramar Bose , 2024

GIT Hub Link of Project Code:

https://github.com/Balamuniyandi/au810021114016_Bala-Muniyandi-G

Youtube Link of Project Code:

https://youtu.be/YxeoN6hJwTM?si=DQHAtxn1o9-qIiTe