

CREDIT CARD FRAUD DETECTION

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17th February,2024

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Introduction

- Credit card fraud is an extensive and ever-growing problem in the financial industry.
- Credit card fraud detection refers to the process of identifying potentially fraudulent transactions.
- This project aims to develop a credit card fraud detection system using machine learning techniques.

Central Idea

- The project focuses on validating a transaction using a dataset.
- It is a binary classification task: predicting whether a transaction is legit or fraudulent.

Dataset Description

- The Dataset includes information such as Features V1, V2, ... V28 which are the principal components obtained with PCA.
- The feature 'Time' contains the seconds elapsed between each transaction and the first transaction in the dataset.
- The feature 'Amount' is the transaction Amount, this feature can be used for example-dependant cost-sensitive learning.
- The feature 'Class' is the response variable and it takes value 1 in case of fraud and 0 otherwise.

Model Building

Three classification models have been implemented in the project:

- Logistic Regression
- Decision Tree Classifier
- Random Forest Classifier

The performance of the models is assessed using common classification metrics:

- Accuracy
- Precision
- Recall
- F1-score

- Framework : gradio
- Programming Language: Python
- Version Control : Git lab

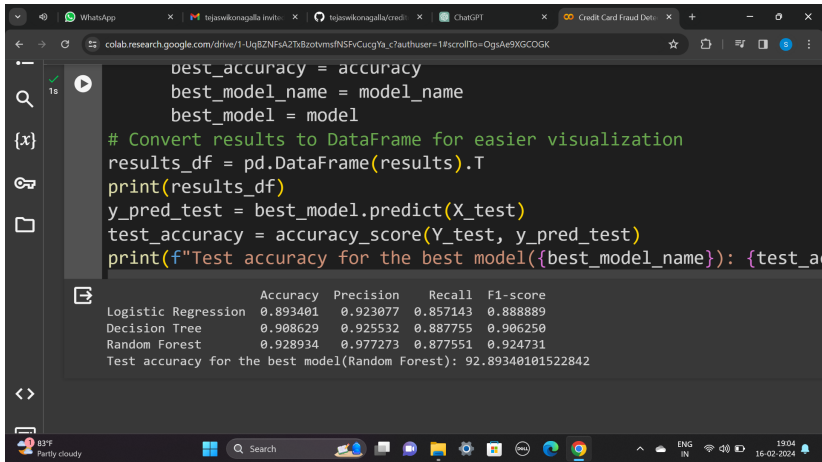
Accuracy Results

Table 1: Models with Accuracy

Model	Accuracy
Logistic Regression	0.89
Decision Tree Classifier	0.90
RandomForest Classifier	0.92

- Selected Model : RandomForest Classifier

Evaluation Metrics



The screenshot shows a Google Colab notebook interface. The top browser bar displays several tabs: WhatsApp, tejaswikonagalla invite, tejaswikonagalla/credi, ChatGPT, and Credit Card Fraud Det. The address bar shows a Google Drive link. The notebook's left sidebar contains icons for search, file explorer, and other functions. The main area displays Python code for evaluating a model's performance. The code defines variables for best accuracy, model name, and model, then converts results to a DataFrame, prints them, and calculates test accuracy for a specific model (Random Forest). The output shows a table of metrics for three models: Logistic Regression, Decision Tree, and Random Forest, followed by the test accuracy for the best model (Random Forest).

```
best_accuracy = accuracy
best_model_name = model_name
best_model = model

# Convert results to DataFrame for easier visualization
results_df = pd.DataFrame(results).T
print(results_df)
y_pred_test = best_model.predict(X_test)
test_accuracy = accuracy_score(Y_test, y_pred_test)
print(f"Test accuracy for the best model({best_model_name}): {test_a
```

	Accuracy	Precision	Recall	F1-score
Logistic Regression	0.893401	0.923077	0.857143	0.888889
Decision Tree	0.908629	0.925532	0.887755	0.906250
Random Forest	0.928934	0.977273	0.877551	0.924731

Test accuracy for the best model(Random Forest): 92.89340101522842

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Interface

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Credit Card Fraud Detector

Enter transaction details to predict if it's fraudulent or legitimate.

amount

time

Clear

Submit

output

Flag

Interface

Credit Card Fraud Detector

Enter transaction details to predict if it's fraudulent or legitimate.

amount	output
<input type="text" value="492"/>	<input type="text" value="Fraud"/>
time	
<input type="text" value="525"/>	
<input type="button" value="Clear"/>	<input type="button" value="Flag"/>
<input type="button" value="Submit"/>	

Thank You