Credit Card Fraud Detection

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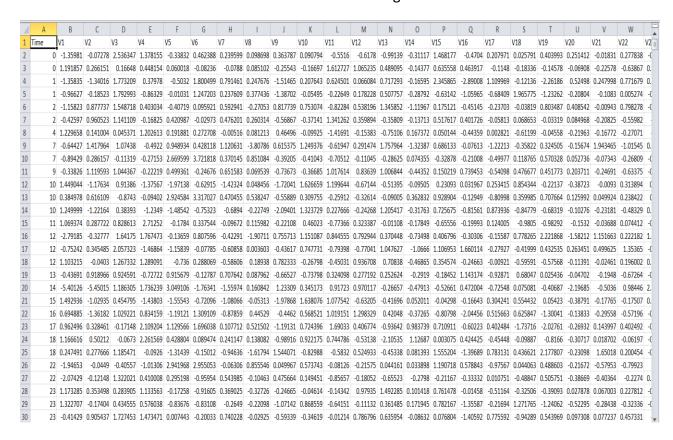
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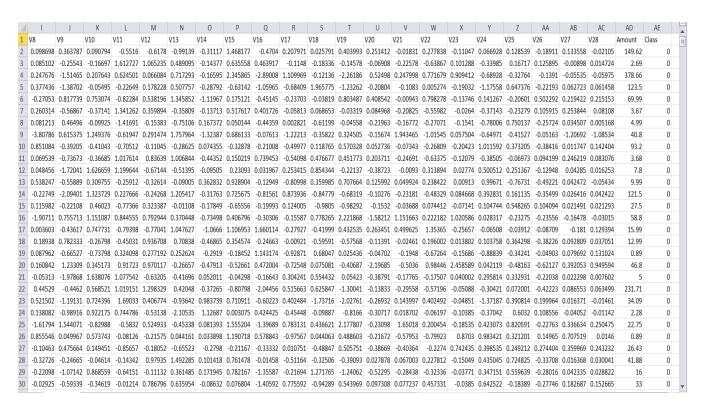
1. Abstract

Credit card fraud detection is critical for financial institutions to protect customers from fraudulent transactions. This project implements a machine learning model to detect fraudulent transactions using a dataset containing transaction features and a target class indicating whether a transaction is fraudulent or not.

2. Dataset

The dataset used for this project is creditcard.csv. It contains features such as transaction time, amount, and anonymized variables (likely PCA components), along with a target variable Class where 1 indicates fraud and 0 indicates a legitimate transaction.





3. Methodology

3.1 Data Preprocessing

The dataset is first loaded using pandas. The target variable Class is separated from the feature set:

```
python
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df = pd.read_csv('creditcard.csv')
y = df['Class']
x = df.drop('Class', axis=1)
```

The data is split into training and testing sets using an 80-20 split:

python

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3.2 Train-Test Split

x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=42)

3.3 Model Training

A Random Forest Classifier is trained on the training data. Random Forest is chosen due to its robustness and ability to handle imbalanced datasets:

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clr = RandomForestClassifier(n_estimators=100, random_state=42)
clr.fit(x_train, y_train)
3.4 Prediction and Evaluation
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The trained model is used to predict the test data, and the accuracy of the model is evaluated:

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```
y_pred = clr.predict(x_test)
```

print("accuracy :", accuracy_score(y_test, y_pred))

This script calculates and prints the accuracy of the model on the test set.

IMPLEMENTATION



4. Results

The model's performance is measured in terms of accuracy, which reflects the proportion of correctly identified transactions (both fraudulent and legitimate) out of all transactions in the test set.

5. Conclusion

The Random Forest model provides a reliable method for detecting credit card fraud, leveraging the ensemble learning approach to handle the complexities and imbalances inherent in the data. Future work could involve tuning the model's hyperparameters, exploring other machine learning algorithms, or employing techniques like SMOTE to address class imbalance.

Sources

repository.rit.edu - Credit Card Fraud Detection Using Machine Learning kaggle.com - Credit Card Fraud Detection

youtube.com - Project 22 : Credit Card Fraud Detection Using Machine youtube.com - Credit Card Fraud Detection using Machine Learning youtube.com - Credit Card Fraud Detection Using Machine Learning And