CREDIT SCORE PREDICTION

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2. Introduction

What is Credit Score Prediction?

Credit score prediction is the process of using historical financial data to determine whether a person has a good or bad credit score. A credit score is a numerical representation of a person's creditworthiness, which helps banks and financial institutions make loan decisions.

Why is Credit Score Prediction Important?

- Helps banks decide loan approvals
- Reduces financial risk
- Provides insights into creditworthiness
- Prevents fraudulent activities

Factors Affecting Credit Score:

1. **Payment History** – Whether payments were made on time
2. **Credit Utilization** – Percentage of credit used
3. **Length of Credit History** – Duration of credit account usage
4. **Types of Credit** – Loans, mortgages, credit card

3. Methodology

Step 1: Data Collection

- The dataset consists of age, income, loan amount, credit history, and credit score.
- The data is loaded using Pandas.

Step 2: Data Preprocessing

- Handling missing values
- Converting categorical data into numerical form
- Normalizing the dataset using StandardScaler

Step 3: Model Training

- Logistic Regression is used for classification.
- The dataset is split into training and testing sets.

Step 4: Model Evaluation

- Accuracy score is calculated.
- Confusion matrix is used to visualize predictions.

Step 5: Prediction

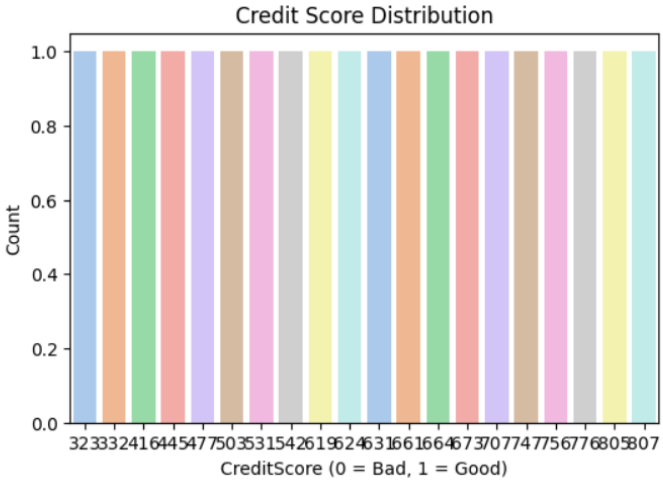
- The trained model is used to predict new credit scores.

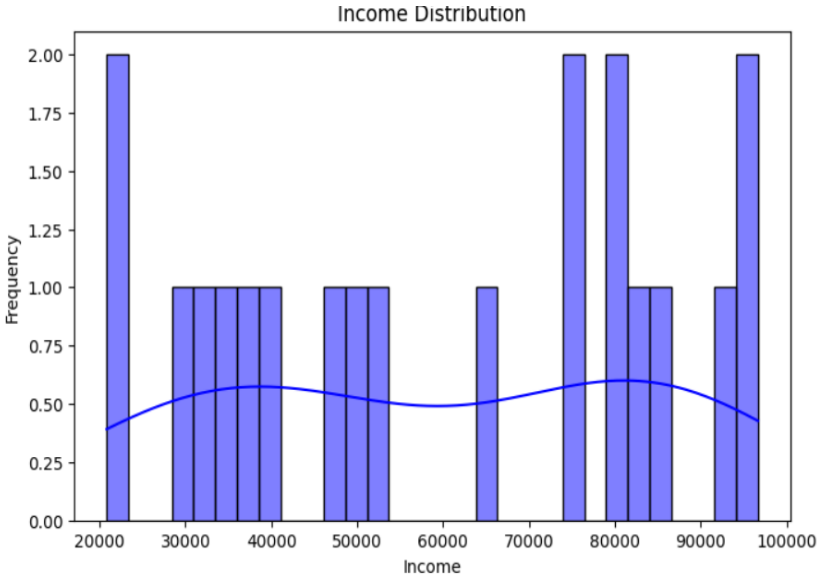
TYPED CODE:

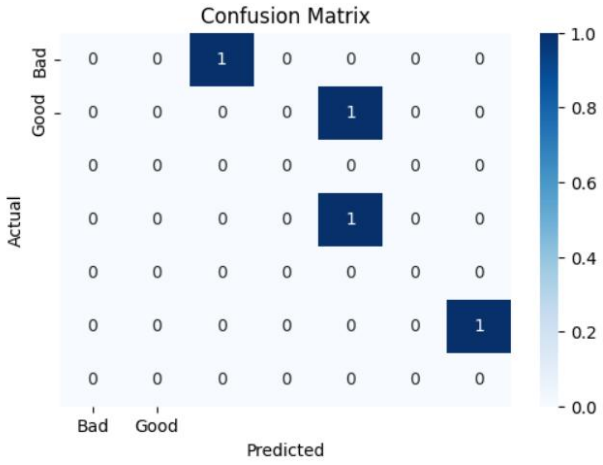
```
 import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

import seaborn as sns

from sklearn.model_selection import train_test_split

from sklearn.preprocessing import StandardScaler

from sklearn.linear_model import LogisticRegression

from sklearn.metrics import confusion_matrix, accuracy_score


# 1. Load the dataset (Replace with your actual dataset)

df = pd.read_csv("credit_data.csv")


# 2. Select Features and Target

X = df[['CustomerID','Age', 'Income', 'LoanAmount', 'CreditScore']]  # Features

y = df['CreditScore']  # Target (1 = Good, 0 = Bad)


# 3. Visualize Credit Score Distribution

plt.figure(figsize=(6, 4))

sns.countplot(x=y, palette="pastel")

plt.title("Credit Score Distribution")

plt.xlabel("CreditScore (0 = Bad, 1 = Good)")
```

```
plt.ylabel("Count")

plt.show()


# 4️⃣ Visualize Income Distribution

plt.figure(figsize=(8, 5))

sns.histplot(df['Income'], bins=30, kde=True, color='blue')

plt.title("Income Distribution")

plt.xlabel("Income")

plt.ylabel("Frequency")

plt.show()


# 5️⃣ Split Data into Training & Testing Sets

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)


# 6️⃣ Normalize Data

scaler = StandardScaler()

X_train = scaler.fit_transform(X_train)

X_test = scaler.transform(X_test)


# 7️⃣ Train Model

model = LogisticRegression()

model.fit(X_train, y_train)
```

```
# 8️⃣ Make Predictions
y_pred = model.predict(X_test)

# 9️⃣ Confusion Matrix Visualization
conf_matrix = confusion_matrix(y_test, y_pred)
plt.figure(figsize=(6, 4))
sns.heatmap(conf_matrix, annot=True, fmt="d", cmap="Blues", xticklabels=['Bad', 'Good'], yticklabels=['Bad', 'Good'])
plt.title("Confusion Matrix")
plt.xlabel("Predicted")
plt.ylabel("Actual")
plt.show()

# 🔟 Show Model Accuracy
accuracy = accuracy_score(y_test, y_pred)
print("Model Accuracy:", accuracy)

# 📊 Bar Chart for Model Accuracy
plt.figure(figsize=(5, 4))
plt.bar(["Accuracy"], [accuracy], color="green")
plt.ylim(0, 1)
plt.ylabel("Score")
plt.title("Model Accuracy")
plt.show()
```


Credit Score Distribution
Count
1.0
0.8
0.6
0.4
0.2
0.0
CreditScore (0 = Bad, 1 = Good)


Income Distribution
Frequency
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
20000
30000
40000
50000
60000
70000
80000
90000
100000
Income


Confusion Matrix
Bad
Good
Actual
0 0 1 0 0 0 0
0 0 0 0 1 0 0
0 0 0 0 0 0 0
0 0 0 0 1 0 0
0 0 0 0 0 0 0
0 0 0 0 0 0 1
0 0 0 0 0 0 0
Bad
Good
Predicted
1.0
0.8
0.6
0.4
0.2
0.0