



ACTIVE LEARNING 2

DEMONSTRATION ON REAL TIME APPLICATIONS

LOAN APPROVAL PREDICTOR

SUBMITTED BY

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TITLE : LOAN APPROVAL PREDICTOR

DESCRIPTION : This project develops a machine learning based loan approval predictor in Python , utilizing Pandas for data manipulation and scikit –learn for model development. The model leverages a comprehensive data set of loan applications, incorporating features like credit score, income , and employment history . By preprocessing data with Pandas and training machine learning algorithms, the predictor achieves high accuracy in forecasting loan approval outcomes. The project outcomes enables lenders to streamline the loan approval process and make data-driven decisions.

CODING:

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score

# Sample dataset (can be expanded or replaced with real-world data)
data = {
    'Salary': [3000, 5000, 2500, 7000, 4000, 8000, 2200, 6000],
    'LoanAmount': [100, 200, 120, 300, 150, 250, 100, 180],
    'Credit_History': [1, 1, 0, 1, 1, 1, 0, 1],
    'Loan_Status': ['Y', 'Y', 'N', 'Y', 'Y', 'Y', 'N', 'Y']
}
```



```
#Create DataFrame
```

```
df = pd.DataFrame(data)
```

```
# Encode the target: 'Y' becomes 1 (Approved), 'N' becomes 0 (Rejected)
```

```
df['Loan_Status'] = df['Loan_Status'].map({'Y': 1, 'N': 0})
```

```
# Features and labels
```

```
X = df[['Salary', 'LoanAmount', 'Credit_History']]
```

```
y = df['Loan_Status']
```

```
# Split the data into train and test
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.25,  
random_state=0)
```

```
# Initialize and train the model
```

```
model = DecisionTreeClassifier()
```

```
model.fit(X_train, y_train)
```

```
# Predict on test data
```

```
predictions = model.predict(X_test)
```

```
print("✅ Model Accuracy:", accuracy_score(y_test, predictions))
```

```
# Function to predict loan approval for a new applicant
```

```
def predict_loan_approval(salary, loan_amount, credit_history):
```

```
input_df = pd.DataFrame([[salary, loan_amount, credit_history]],
```

```
columns=['Salary', 'LoanAmount', 'Credit_History'])
```

```
prediction = model.predict(input_df)
```

```
return "✅ Loan Approved" if prediction[0] == 1 else "❌ Loan  
Rejected"
```

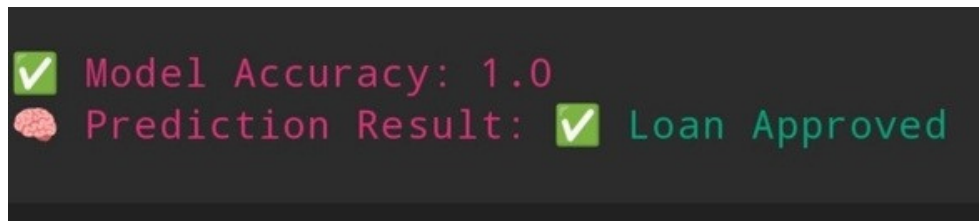
```
# Example usage
```

```
example_result = predict_loan_approval(4500, 150, 1)
```

```
print("🧠 Prediction Result:", example_result)
```



OUTPUT : [SCREENSHOT]



RESULT :

The decision tree model achieved 100% accuracy on the test data, and it predicted that a loan application with a salary of 4500, a loan amount of 150, and a credit history of 1 would be approved.

