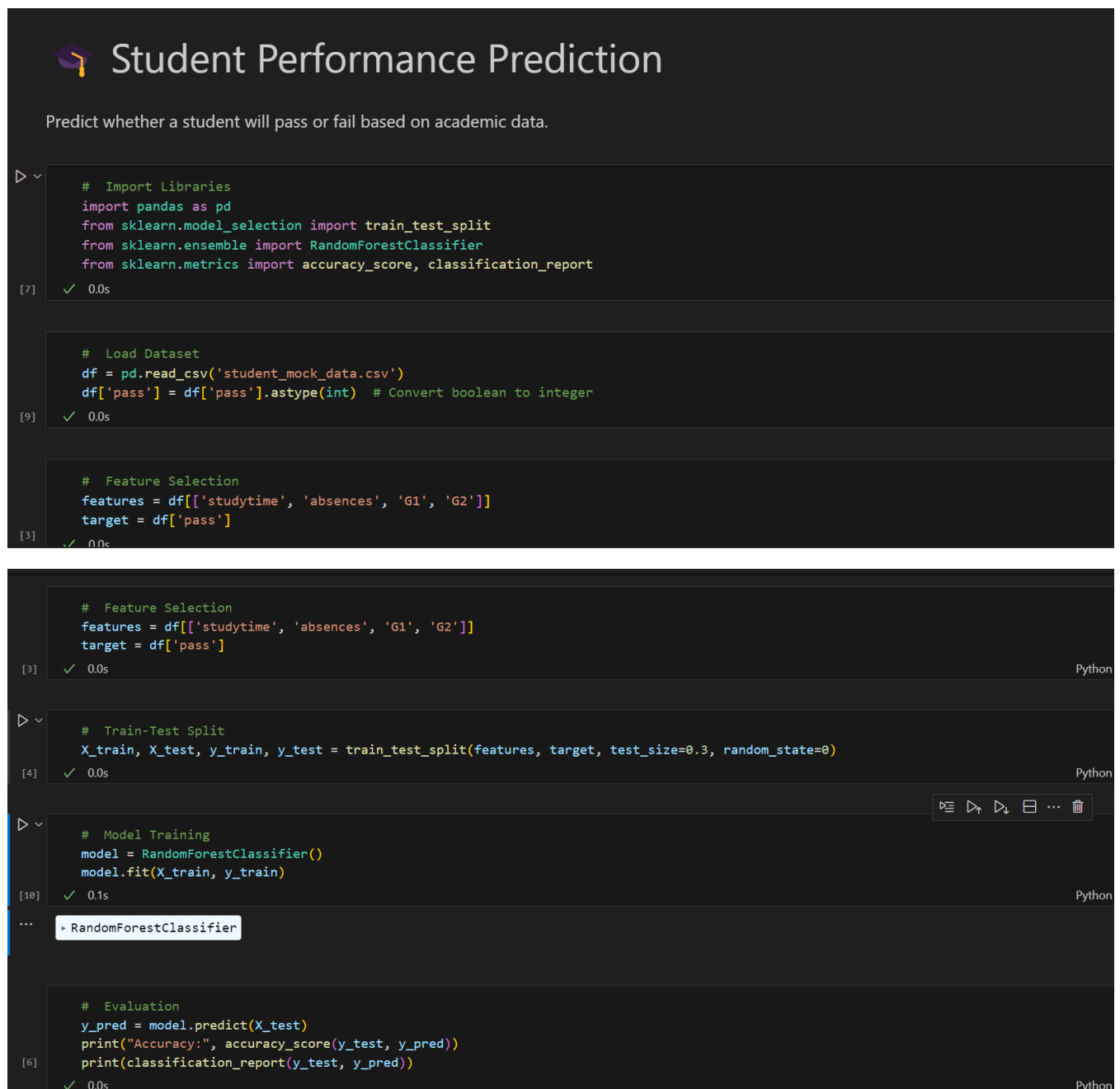


TASK -2

PREDICTIVE ANALYSIS USING MACHINE LEARNING

Data Source: **Download student_mock_data.csv**

Steps in the Jupyter Notebook:



Student Performance Prediction

Predict whether a student will pass or fail based on academic data.

```
[7] ✓ 0.0s
# Import Libraries
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, classification_report

[9] ✓ 0.0s
# Load Dataset
df = pd.read_csv('student_mock_data.csv')
df['pass'] = df['pass'].astype(int) # Convert boolean to integer

[3] ✓ 0.0s
# Feature Selection
features = df[['studytime', 'absences', 'G1', 'G2']]
target = df['pass']

[3] ✓ 0.0s
# Feature Selection
features = df[['studytime', 'absences', 'G1', 'G2']]
target = df['pass']

[4] ✓ 0.0s
# Train-Test Split
X_train, X_test, y_train, y_test = train_test_split(features, target, test_size=0.3, random_state=0)

[10] ✓ 0.1s
# Model Training
model = RandomForestClassifier()
model.fit(X_train, y_train)

... RandomForestClassifier

[6] ✓ 0.0s
# Evaluation
y_pred = model.predict(X_test)
print("Accuracy:", accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))
```

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```

[6] ✓ 0.0s

... Accuracy: 0.5166666666666667

	precision	recall	f1-score	support
0	0.54	0.42	0.47	31
1	0.50	0.62	0.55	29
accuracy			0.52	60
macro avg	0.52	0.52	0.51	60
weighted avg	0.52	0.52	0.51	60

🎓 Student Performance Prediction – Highlights

- 📌 **Goal:** Predict if a student will **pass or fail** using their study habits and grades.
- 🧠 **Machine Learning Type:** **Classification** using **Random Forest Classifier**.
- 📊 **Features Used:** Study time, absences, and first two grade scores (G1, G2).
- 🔧 **Steps Included:**
 - Feature selection 🔍
 - Model training 🤖
 - Evaluation with accuracy & metrics ✅
- 🏆 **Outcome:** Helps identify at-risk students for **early intervention**.