Artificial Intelligence

Lab Tasks # 13

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Batch: BSCS-6th semester

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Task # 01

```python
import pandas as pd
from sklearn import tree
import matplotlib.pyplot as plt

# Step 1: Load dataset from CSV file
data = pd.read_csv("C:/Users/Lenovo/Downloads/study_dataset.csv")  # Update path if needed

# Step 2: Separate features and labels
X = data.drop( labels: "Pass", axis=1)
Y = data["Pass"]

# Step 3: Create and train the model
clf = tree.DecisionTreeClassifier()
clf = clf.fit(X, Y)

# Step 4: Predict for a new student
sample = pd.DataFrame( data: [[3, 7, 1]], columns=["Hours_Studied", "Sleep_Hours", "Tuition_Attended"])
prediction = clf.predict(sample)

print("Will the student pass? (1 = Yes, 0 = No):", prediction[0])

# Step 5: Visualize the tree
plt.figure(figsize=(12, 8))
```

```python
tree.plot_tree(clf,
               feature_names=X.columns,
               class_names=["Fail", "Pass"],
               filled=True)
plt.title("Decision Tree - Student Pass Prediction")
plt.show()
```

Output

```
Will the student pass? (1 = Yes, 0 = No): 1
```

Decision Tree - Student Pass Prediction