

## Assignment 3

# Decision Tree Assignment - Single Script Version

```
import pandas as pd
import numpy as np
import seaborn as sb
import matplotlib.pyplot as plt
```

```
# Load dataset
a = pd.read_csv("Admission_Predict.csv")
print("First 5 rows of dataset:")
print(a.head())
```

```
# Convert target variable into binary classification
a["Chance of Admit "] = a["Chance of Admit "].apply(lambda x: 1 if x >= 0.75 else 0)
```

```
# Define features (X) and target (Y)
X = a[['Serial No.', 'GRE Score', 'TOEFL Score', 'University Rating', 'SOP',
       'LOR ', 'CGPA', 'Research']]
Y = a[['Chance of Admit ']]
```

```
# Split dataset
from sklearn.model_selection import train_test_split
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2, random_state=42)
```

```
# Train Decision Tree Classifier
from sklearn.tree import DecisionTreeClassifier, plot_tree
model = DecisionTreeClassifier(criterion="entropy", random_state=42)
model.fit(X_train, Y_train)
```

```
# Predictions
y_predict = model.predict(X_test)
```

```
# Model Evaluation
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
print("\nAccuracy:", accuracy_score(Y_test, y_predict))
print("\nClassification Report:\n", classification_report(Y_test, y_predict))
print("\nConfusion Matrix:\n", confusion_matrix(Y_test, y_predict))
```

```
# Plot decision tree (limited depth for readability)
plt.figure(figsize=(12,6))
plot_tree(model, filled=True, feature_names=X.columns, class_names=["Not Admitted",
                             "Admitted"],
          max_depth=2, rounded=True)
plt.show()
```