TITLE 2

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import pandas as pd

from sklearn.model\_selection import train\_test\_split

from sklearn.svm import SVC

from sklearn.tree import DecisionTreeClassifier

from sklearn.metrics import accuracy\_score, classification\_report, confusion\_matrix

from sklearn.compose import ColumnTransformer

from sklearn.preprocessing import OneHotEncoder, StandardScaler

from sklearn.pipeline import Pipeline

import numpy as np

csv\_path = "C:/Users/Arshad/Desktop/yamini main.csv"

df = pd.read\_csv(csv\_path)

selected\_features = ['RL', 'glaucoma', 'age', 'ocular\_pressure', 'Mean\_deviation',

'PSD', 'GHT', 'cornea\_thickness', 'RNFL4.mean']

features = df[selected\_features]

labels = df['glaucoma']

categorical\_features = ['RL', 'GHT']

preprocessor = ColumnTransformer(

transformers=[

('num', StandardScaler(), features.select\_dtypes(include='number').columns),

('cat', OneHotEncoder(handle\_unknown='ignore'), categorical\_features)

])

svm\_pipeline = Pipeline([

('preprocessor', preprocessor),

('classifier', SVC(C=0.15, kernel='rbf', gamma='scale', random\_state=82))

])

X\_train\_svm, X\_test\_svm, y\_train\_svm, y\_test\_svm = train\_test\_split(features, labels, test\_size=0.85, random\_state=72)

svm\_pipeline.fit(X\_train\_svm, y\_train\_svm)

svm\_predictions = svm\_pipeline.predict(X\_test\_svm)

svm\_accuracy = accuracy\_score(y\_test\_svm, svm\_predictions)

print(f"SVM Accuracy: {svm\_accuracy}")

print("Classification Report (SVM):")

print(classification\_report(y\_test\_svm, svm\_predictions))

print("Confusion Matrix (SVM):")

print(confusion\_matrix(y\_test\_svm, svm\_predictions))

numeric\_features = features.select\_dtypes(include='number').columns

features\_noisy = features.copy()

features\_noisy[numeric\_features] += np.random.normal(0, 1.0, size=(len(features), len(numeric\_features)))

dt\_pipeline = Pipeline([

('preprocessor', preprocessor),

('classifier', DecisionTreeClassifier(max\_depth=3, random\_state=42)) # Limit the depth to reduce complexity

])

X\_train\_dt, X\_test\_dt, y\_train\_dt, y\_test\_dt = train\_test\_split(features\_noisy, labels, test\_size=0.85, random\_state=42)

dt\_pipeline.fit(X\_train\_dt, y\_train\_dt)

dt\_predictions = dt\_pipeline.predict(X\_test\_dt)

dt\_accuracy = accuracy\_score(y\_test\_dt, dt\_predictions)

print(f"Decision Tree Accuracy: {dt\_accuracy}")

print("Classification Report (Decision Tree):")

print(classification\_report(y\_test\_dt, dt\_predictions))

print("Confusion Matrix (Decision Tree):")

print(confusion\_matrix(y\_test\_dt, dt\_predictions))