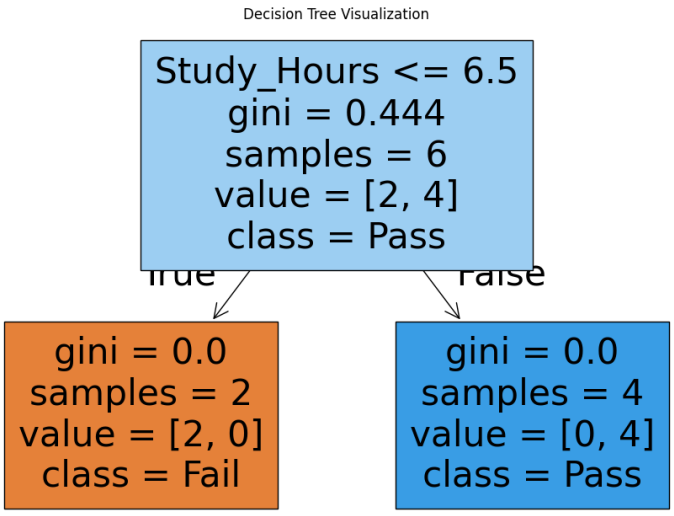
BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai – 400058-India

DEPARTMENT OF COMPUTERE ENGINEERING

SUBJECT: Machine Learning

Name	**Raj Kalpesh Mathuria**
UID no.	**2023300139**

Experiment no.	
AIM :	**Decision Trees**
Theory:	A **Decision Tree** is a supervised learning algorithm used for **classification and regression**. It works by recursively splitting the dataset based on feature values to create **homogeneous subsets**. For **numerical features**, splits are made using **thresholds**, and the best split is chosen by minimizing an impurity measure such as **Gini impurity** (or maximizing Information Gain). The process continues until nodes become pure or stopping criteria are met.
Code:	**https://github.com/CodeCraftsmanRaj/ML_Sem6**
OUTPUT:	

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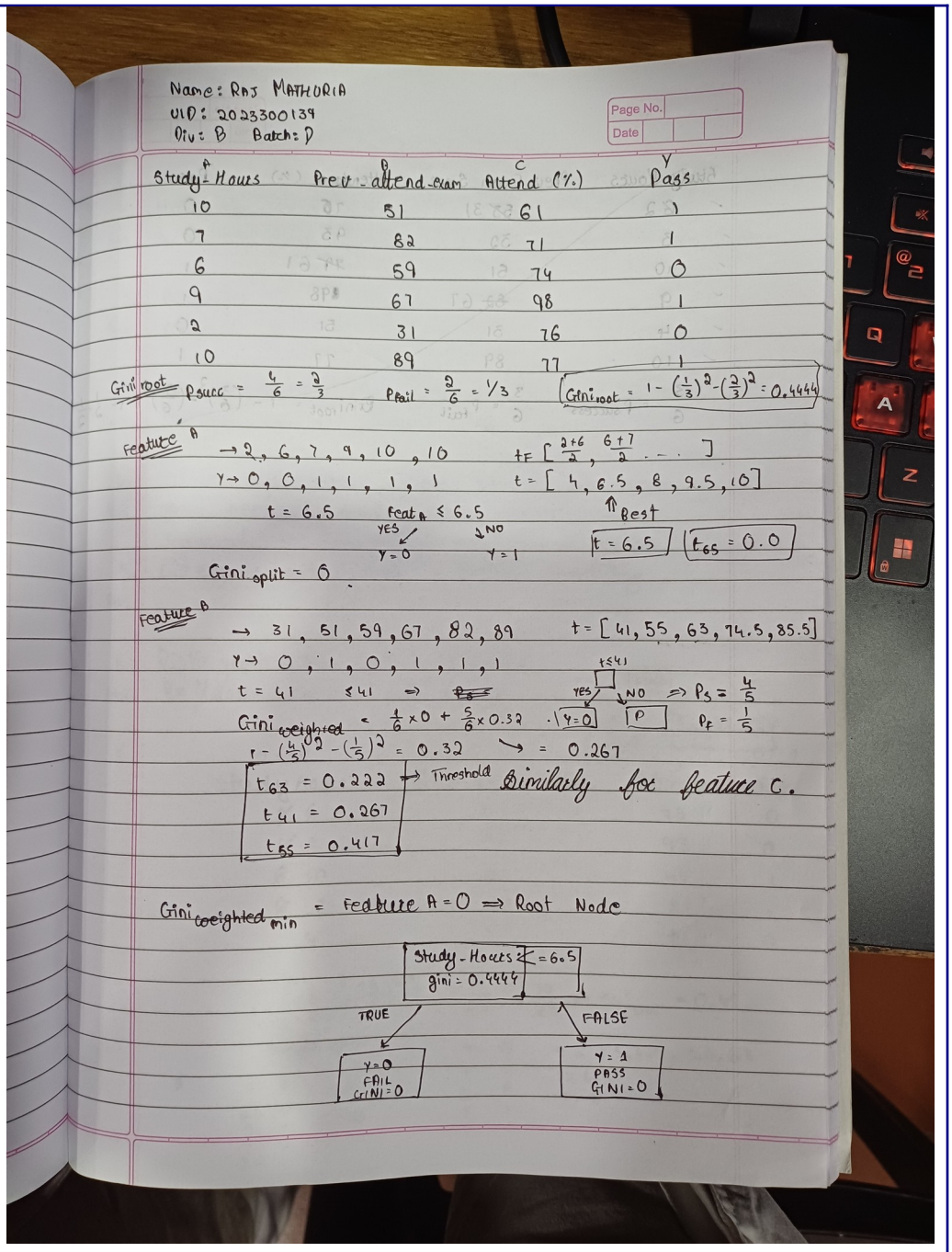

CONCLUSION:	In this experiment, a decision tree was manually constructed by calculating **Gini impurity** for different numerical feature split points. For the feature **Prev_Exam_Score**, candidate thresholds were evaluated, and the split at **63.0** produced the **minimum weighted Gini impurity (0.222)**. This shows that decision trees effectively identify the most informative feature thresholds to separate classes, and manual calculations help in understanding how trees make optimal decisions.