VIGNAN'S NIRULA
INSTITUTE OF TECHNOLOGY & SCIENCE FOR WOMEN
(Approved by AICTE, New Delhi & Affiliated to JNTU Kakinada)
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Department of Information Technology

Innovative Teaching Practice

Faculty Name : Mr.M. Mallikarjuna Rao, Mr.R.Veera Babu.
Course Name : Machine Learning
Class : III B.Tech I Semester
Academic Year : 2022-2023
Title of the Topic : Decision Tree Algorithm
Activity Name : Think-pair share

Objective of the Activity:
The objective of this Think-Pair-Share activity is to help students understand the Decision Tree Algorithm, including its construction, attribute selection measures, and real-world applications. Students will develop analytical and problem-solving skills by interpreting tree structures and evaluating their performance.

Activity Procedure :

1. **Preparation:**
    - Provide students with a sample dataset containing features and target variables.
    - Prepare worksheets for students to construct a Decision Tree, calculate attribute selection measures (e.g., Gini Index, Information Gain), and interpret results.
    - Briefly explain the Decision Tree Algorithm, including its construction, splitting criteria, overfitting, and pruning concepts.

2. **Phase 1 – Think (5-7 minutes):**
    - Students individually analyze the dataset and calculate the attribute selection measure for one feature to determine the best split.
    - They construct the initial part of the Decision Tree based on their calculations and document the steps on the worksheet.

3. **Phase 2 – Pair (10-15 minutes):**
    - Students collaborate with their partner to compare their initial tree structures and calculations.
    - Each pair works together to complete the tree construction, discuss pruning strategies, and analyze potential overfitting issues.
    - They interpret the tree to understand decision-making and identify patterns in the dataset.

4. **Phase 3 – Share (10-12 minutes):**

- Each pair presents their Decision Tree to the class, explaining the splitting criteria, tree structure, and their observations.
- A class-wide discussion is facilitated by the instructor to compare the constructed trees and discuss their accuracy and real-world relevance.

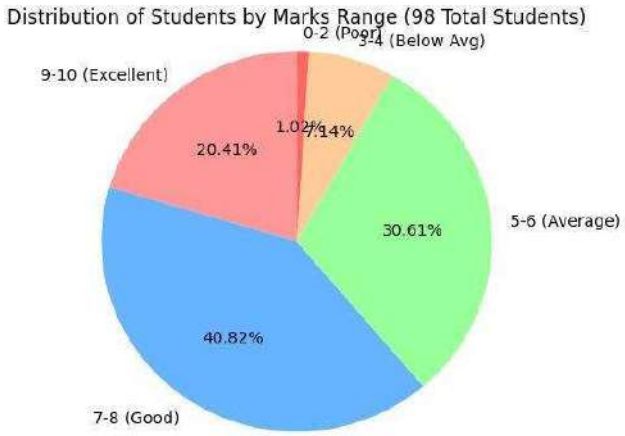
5. **Wrap-Up (5 minutes):**

- Reflection on key learnings from the activity, focusing on the advantages, limitations, and applications of the Decision Tree Algorithm.
- Students discuss scenarios where Decision Trees work effectively and compare them to other machine learning algorithms.

Screenshot of the Practice

Assessment Analysis

Marks Range	Number of Students	Percentage
9-10 (Excellent)	20	20.41%
7-8 (Good)	40	40.82%
5-6 (Average)	30	30.61%
3-4 (Below Avg)	7	7.14%
0-2 (Poor)	1	1.02%
Total	98	100%



Conclusion of Think-Pair-Share Activity:

The Think-Pair-Share activity on the Decision Tree Algorithm effectively engaged students in a collaborative and hands-on learning experience. Students showcased their ability to construct Decision Trees, calculate attribute selection measures, and interpret tree structures, gaining valuable insights into the algorithm's application and performance in real-world scenarios.

Signature of the Faculty **Head of the Department**