

DECISION TREE

1) **Aim:** To implement and design decision tree using weka.

Algorithm:

- Determine root node
- Calculate entropy for classes
- Calculate entropy after split for each attributes.
- Calculate information gain
- Perform split
- Perform further split
- Compute decision tree

Output:

The screenshot displays the Weka Explorer application window. The 'Classify' tab is active, showing the 'Classifier' as 'REPTree -M 2 -V 0.001 -N 3 -S 1 -L -1 -I 0.0'. The 'Test options' section is set to 'Cross-validation' with 'Folds: 10'. The 'Result list' on the left shows two results: '20:17:34 - rules.DecisionTable' and '20:18:23 - trees.REPTree', with the latter selected. The 'Classifier output' pane displays the following information:

Feature set: 1,2,3,20,21
Time taken to build model: 0.47 seconds
=== Stratified cross-validation ===
=== Summary ===

	Correctly Classified Instances	710	71	%
Incorrectly Classified Instances	290	29	%	
Kappa statistic	0.2033			
Mean absolute error	0.3677			
Root mean squared error	0.4321			
Relative absolute error	87.505 %			
Root relative squared error	94.2815 %			
Total Number of Instances	1000			

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
Weighted Avg.	0.710	0.534	0.660	0.710	0.679	0.220	0.723	0.741	good
									bad

=== Confusion Matrix ===

	a	b	<-- classified as
625 75	a = good		
215 85	b = bad		

The bottom of the window shows the 'Weka GUI Chooser' and a sidebar with 'Applications' including Explorer, Experimenter, KnowledgeFlow, Workbench, and Simple CLI. The status bar at the bottom indicates 'Weka Environment for Knowledge Analysts Version 3.8.6 (c) 1999 - 2022 The University of Waikato Hamilton, New Zealand' and system information like '27°C Mostly cloudy' and '05-02-2023'.