Much of the work in our project depends on decision-making skills with automatic decision-making algorithms. This model evaluation is a performance-based analysis of the 6-week predictive analysis project. It will help us to determine whether the predictive model is accurate enough to consider for further or bigger analysis. Since the output is probabilistic(Estimated ER), evaluating predictions becomes a crucial step. There are several ways to find out the accuracy of an algorithm, most of them focus on finding the difference between the actual and predicted entity.

In the decision tree algorithm, we have used two types of model consisting of -

1. Classification/Class Output Models: These models are used to give discrete values as their output. For example, predicting recommendations as Phy or Diet.

2. Continuous/Probabilistic Output Models: These models are, as the name suggests, responsible for predicting continuous values. For example, predicting the ER.

Summary of analysis for Recommendation model evaluation:

Correctly Classified Instances	5	71.4286 %
Incorrectly Classified Instances	2	28.5714 %
Kappa statistic		0.4167
Mean absolute error		0.3487
Root mean squared error		0.4416
Relative absolute error		62.9834 %
Root relative squared error		79.2883 %

Summary of analysis for Estimated ER model evaluation:

Correctly Classified Instances	4	57.1429 %
Incorrectly Classified Instances	3	42.8571 %
Kappa statistic		0.3437
Mean absolute error		0.2171
Root mean squared error		0.3295
Relative absolute error		71.25 %
Root relative squared error		85.303 %

Table 1:Detailed Accuracy by Class

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	.667	.250	.667	.667	.667	.417	.750	.639	0
	.750	.333	.750	.750	.750	.417	.750	.893	1
Weighted avg.	.714	.298	.298	.714	.714	.714	.417	.784	

Classification Accuracy

Accuracy is a common evaluation metric for classification problems. It's the number of correct predictions made divided by all predictions made. In our model, we can see that the accuracy is 71.4286 % which indicated that most of the instance is correctly classified.

Table 2: Confusion Matrix (Recommendation)

	Actually Positive	Actually Negative	classified as
Predicted Positive	2	1	0
Predicted Negative	1	3	1

Table 3: Confusion Matrix (Estimated ER)

a	b	c	d	e	Classified as
1	0	0	0	0	0
0	0	1	0	0	.06
0	0	3	0	0	.17
0	0	1	0	0	.25
1	0	0	0	0	.29

Conclusion

As the accuracy of the prediction is fairly high, we can expect that the prediction has helped the patients to increase their engagement ratio.

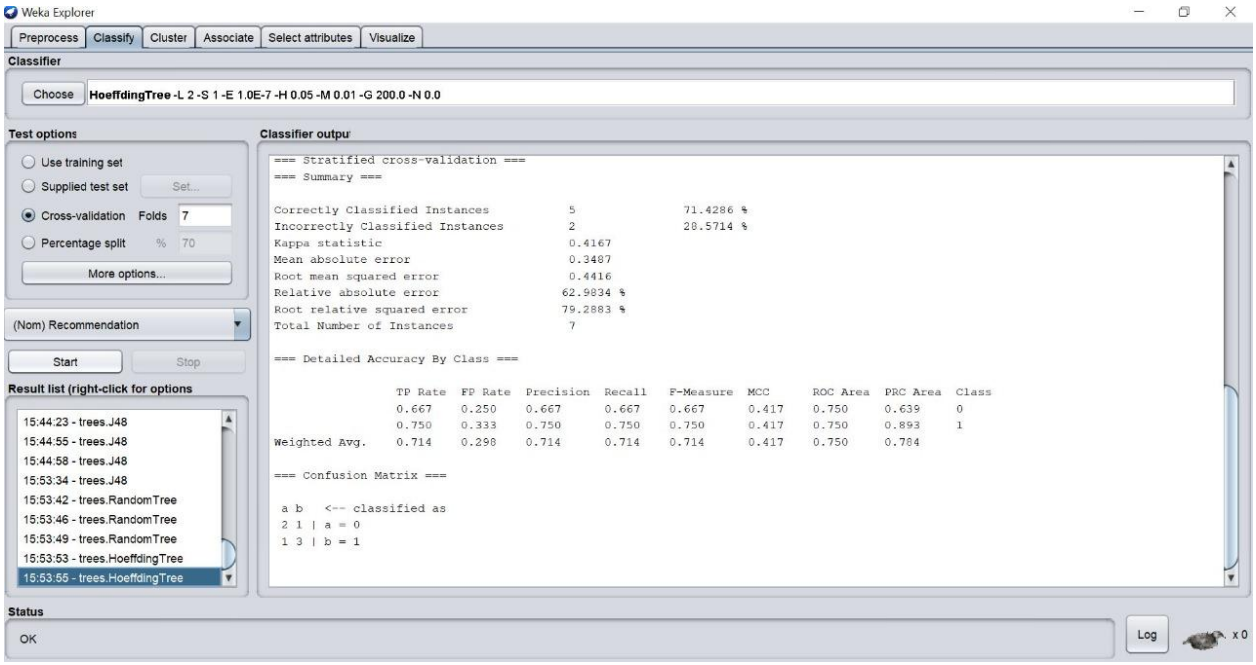
References:

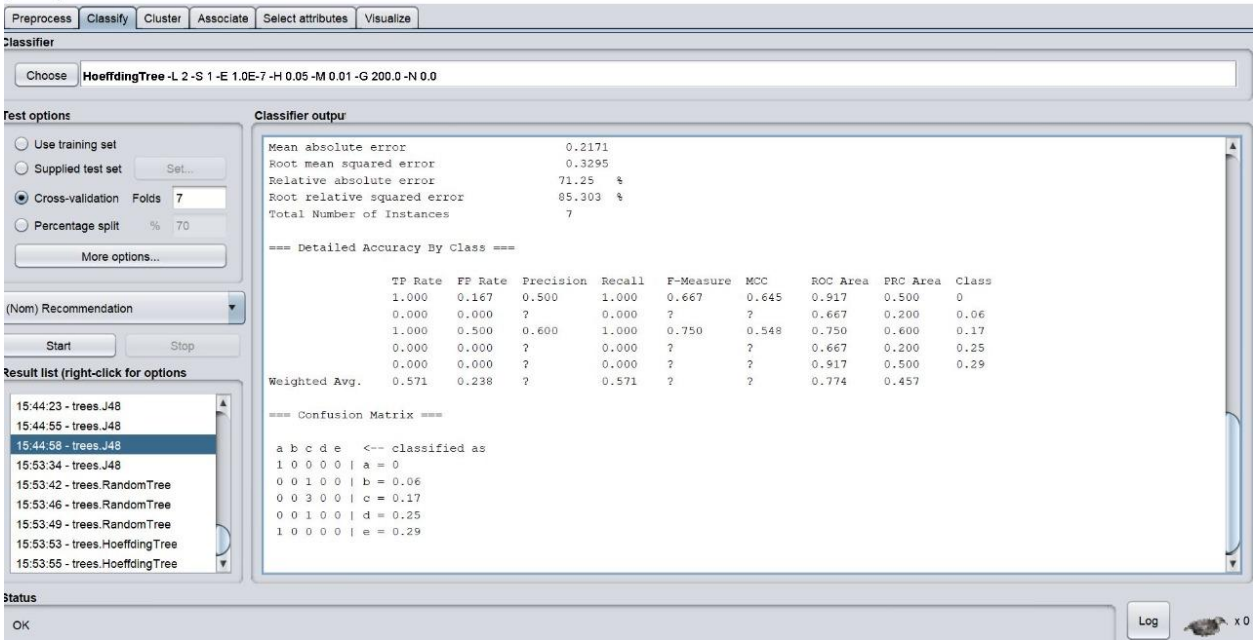
Click here for project details -

project

explanation

The calculations are done using Weka software.WEKA runs on almost any platform and is available on the web here.


Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Classifier
Choose
HoeffdingTree -L 2 -S 1 -E 1.0E-7 -H 0.05 -M 0.01 -G 200.0 -N 0.0
Test options
Use training set
Supplied test set
Set...
Cross-validation
Folds
7
Percentage split
%
70
More options...
Classifier output
=== Stratified cross-validation ===
=== Summary ===
Correctly Classified Instances 5 71.4286 %
Incorrectly Classified Instances 2 28.5714 %
Kappa statistic 0.4167
Mean absolute error 0.3487
Root mean squared error 0.4416
Relative absolute error 62.9834 %
Root relative squared error 79.2883 %
Total Number of Instances 7
=== Detailed Accuracy By Class ===
TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class
0.667 0.250 0.667 0.667 0.667 0.417 0.750 0.639 0
0.750 0.333 0.750 0.750 0.750 0.417 0.750 0.893 1
Weighted Avg. 0.714 0.298 0.714 0.714 0.714 0.417 0.750 0.784
=== Confusion Matrix ===
a b <-- classified as
2 1 | a = 0
1 3 | b = 1
(Nom) Recommendation
Start
Stop
Result list (right-click for options
15:44:23 - trees.J48
15:44:55 - trees.J48
15:44:58 - trees.J48
15:53:34 - trees.J48
15:53:42 - trees.RandomTree
15:53:46 - trees.RandomTree
15:53:49 - trees.RandomTree
15:53:53 - trees.HoeffdingTree
15:53:55 - trees.HoeffdingTree
Status
OK
Log
x 0


Preprocess
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Test options
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Percentage split
%
70
More options...
Classifier output
Mean absolute error 0.2171
Root mean squared error 0.3295
Relative absolute error 71.25 %
Root relative squared error 85.303 %
Total Number of Instances 7
=== Detailed Accuracy By Class ===
TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class
1.000 0.167 0.500 1.000 0.667 0.645 0.917 0.500 0
0.000 0.000 ? 0.000 ? ? 0.667 0.200 0.06
1.000 0.500 0.600 1.000 0.750 0.548 0.750 0.600 0.17
0.000 0.000 ? 0.000 ? ? 0.667 0.200 0.25
0.000 0.000 ? 0.000 ? ? 0.917 0.500 0.29
Weighted Avg. 0.571 0.238 ? 0.571 ? ? 0.774 0.457
=== Confusion Matrix ===
a b c d e <-- classified as
1 0 0 0 0 | a = 0
0 0 1 0 0 | b = 0.06
0 0 3 0 0 | c = 0.17
0 0 1 0 0 | d = 0.25
1 0 0 0 0 | e = 0.29
(Nom) Recommendation
Start
Stop
Result list (right-click for options
15:44:23 - trees.J48
15:44:55 - trees.J48
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Log
x 0