

Breast Cancer Report

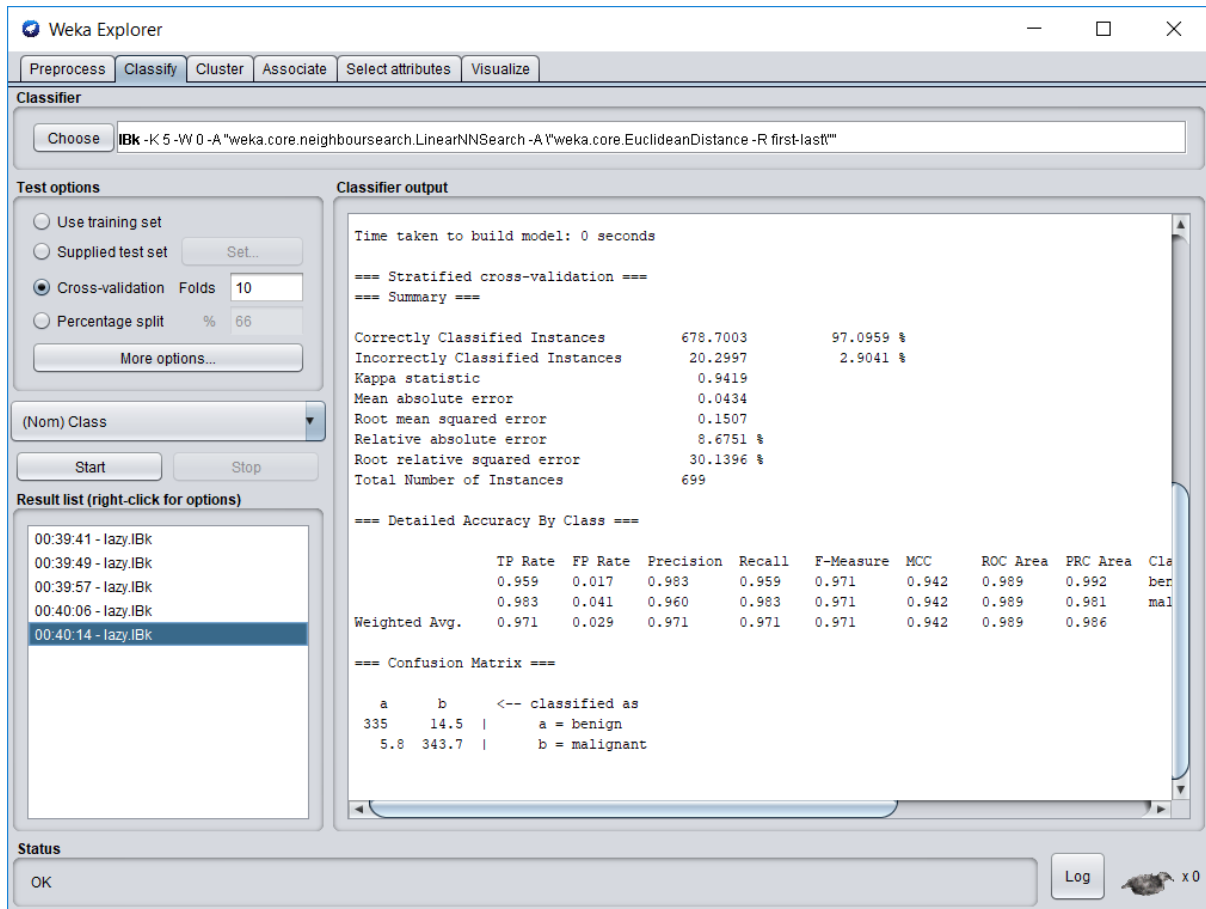
Pre Processing Method:

ClassBalancer – To balance weightage between classes.

Classification Models:

KNN

Where K=5



The screenshot displays the Weka Explorer application window. The 'Classify' tab is active, showing the 'Classifier' section with the selected model: `IBk -K 5 -W 0 -A "weka.core.neighboursearch.LinearNNSearch -A "weka.core.EuclideanDistance -R first-last"`. The 'Test options' section on the left indicates 'Cross-validation' is selected with 'Folds' set to 10. The 'Result list' on the bottom left shows a list of results, with the most recent one selected: '00:40:14 - lazy.IBk'. The 'Classifier output' pane on the right displays the following results:

Time taken to build model: 0 seconds

=== Stratified cross-validation ===

=== Summary ===

Metric	Value	Percentage
Correctly Classified Instances	678.7003	97.0959 %
Incorrectly Classified Instances	20.2997	2.9041 %
Kappa statistic	0.9419	
Mean absolute error	0.0434	
Root mean squared error	0.1507	
Relative absolute error	8.6751 %	
Root relative squared error	30.1396 %	
Total Number of Instances	699	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
benign	0.959	0.017	0.983	0.959	0.971	0.942	0.989	0.992	ben
malignant	0.983	0.041	0.960	0.983	0.971	0.942	0.989	0.981	mal
Weighted Avg.	0.971	0.029	0.971	0.971	0.971	0.942	0.989	0.986	

=== Confusion Matrix ===

a	b	<-- classified as	
335	14.5	a	= benign
5.8	343.7	b	= malignant

The 'Status' bar at the bottom shows 'OK' and a 'Log' button.

SVM:

Weka Explorer

Preprocess **Classify** Cluster Associate Select attributes Visualize

Classifier

Choose **SMO - C 1.0 - L 0.001 - P 1.0E-12 - N 0 - V -1 - W 1 - K "weka.classifiers.functions.supportVector.PolyKernel - E 1.0 - C 250007" - calibrator "weka.classifiers.functions.Logit"**

Test options

☐ Use training set
☐ Supplied test set Set...
☒ Cross-validation Folds **10**
☐ Percentage split % 66

More options...

(Nom) Class

Start Stop

Result list (right-click for options)

- 00:39:41 - lazy.IBk
- 00:39:49 - lazy.IBk
- 00:39:57 - lazy.IBk
- 00:40:06 - lazy.IBk
- 00:40:14 - lazy.IBk
- 00:41:07 - lazy.IBk
- 00:41:15 - trees.J48
- 00:41:58 - functions.SMO**

Classifier output

Time taken to build model: 0.02 seconds

=== Stratified cross-validation ===
 === Summary ===

Correctly Classified Instances	677.402	96.9102 %
Incorrectly Classified Instances	21.598	3.0898 %
Kappa statistic	0.9382	
Mean absolute error	0.0309	
Root mean squared error	0.1758	
Relative absolute error	6.1796 %	
Root relative squared error	35.1555 %	
Total Number of Instances	699	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
benign	0.967	0.029	0.971	0.967	0.969	0.938	0.969	0.955	ben
malignant	0.971	0.033	0.967	0.971	0.969	0.938	0.969	0.954	mal
Weighted Avg.	0.969	0.031	0.969	0.969	0.969	0.938	0.969	0.955	

=== Confusion Matrix ===

	a	b	
a	338.05	11.45	a = benign
b	10.15	339.35	b = malignant

Status

OK Log x0

Decision Tree:

Weka Explorer

Preprocess **Classify** Cluster Associate Select attributes Visualize

Classifier

Choose **J48 - C 0.25 - M 2**

Test options

☐ Use training set
☐ Supplied test set Set...
☒ Cross-validation Folds **10**
☐ Percentage split % 66

More options...

(Nom) Class

Start Stop

Result list (right-click for options)

- 00:39:41 - lazy.IBk
- 00:39:49 - lazy.IBk
- 00:39:57 - lazy.IBk
- 00:40:06 - lazy.IBk
- 00:40:14 - lazy.IBk
- 00:41:07 - lazy.IBk
- 00:41:15 - trees.J48**

Classifier output

Time taken to build model: 0.02 seconds

=== Stratified cross-validation ===
 === Summary ===

Correctly Classified Instances	661.7569	94.6719 %
Incorrectly Classified Instances	37.2431	5.3281 %
Kappa statistic	0.8934	
Mean absolute error	0.0723	
Root mean squared error	0.2178	
Relative absolute error	14.4528 %	
Root relative squared error	43.5524 %	
Total Number of Instances	699	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
benign	0.943	0.050	0.950	0.943	0.947	0.893	0.965	0.962	ben
malignant	0.950	0.057	0.944	0.950	0.947	0.893	0.965	0.955	mal
Weighted Avg.	0.947	0.053	0.947	0.947	0.947	0.893	0.965	0.958	

=== Confusion Matrix ===

	a	b	
a	329.66	19.84	a = benign
b	17.4	332.1	b = malignant

Status

OK Log x0

ANN:

The screenshot shows the Weka Explorer application window. The 'Classify' tab is selected. The classifier chosen is 'MultilayerPerceptron' with parameters '-L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a'. The 'Test options' section shows 'Cross-validation' selected with 'Folds' set to 10. The 'Result list' on the left shows a list of models, with '00:42:33 - functions.MultilayerPerceptron' selected. The 'Classifier output' pane displays the following results:

Time taken to build model: 0.48 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances	674.4256	96.4844 %
Incorrectly Classified Instances	24.5744	3.5156 %
Kappa statistic	0.9297	
Mean absolute error	0.0441	
Root mean squared error	0.185	
Relative absolute error	8.8184 %	
Root relative squared error	36.9911 %	
Total Number of Instances	699	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.963	0.033	0.967	0.963	0.965	0.930	0.987	0.990	benign
	0.967	0.037	0.963	0.967	0.965	0.930	0.987	0.981	malignant
Weighted Avg.	0.965	0.035	0.965	0.965	0.965	0.930	0.987	0.985	

=== Confusion Matrix ===

a	b	<-- classified as
337	13	a = benign
12	338	b = malignant

The 'Status' bar at the bottom shows 'OK' and a 'Log' button.

KNN ,ANN and SVM have high accuracy. However, ANN takes a lot of time for model building.