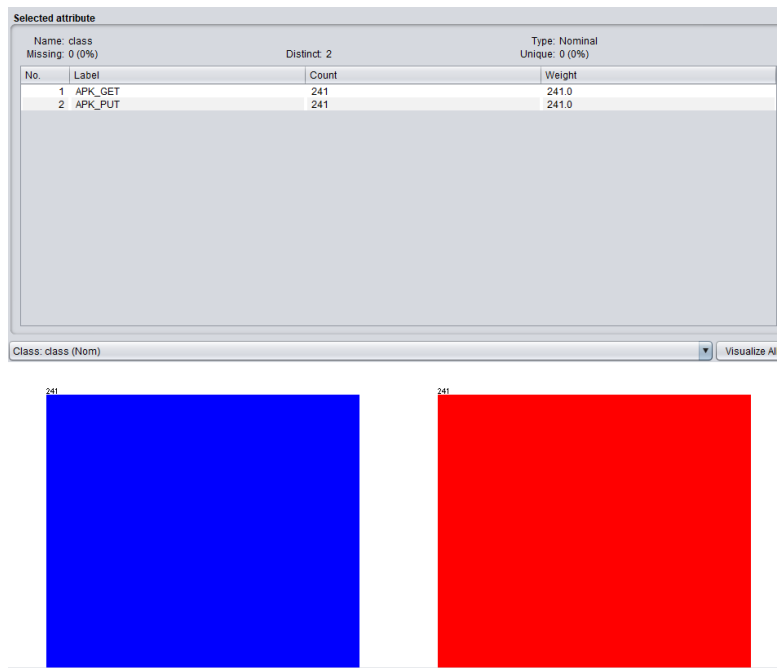


CLASSIFICAZIONE CON LABEL GET PUT

Le istanze sono bilanciate **241 APK_GET** e **241 APK_PUT**.

I primi modelli hanno valore di precision e recall coincidente



MODELLI	PRECISION	RECALL
TLC	0.979	0.979
MITI	0.971	0.971
MIRI	0.965	0.965
MIDD	0.878	0.861
MDD	0.804	0.712
TLDSIMPLE	0.755	0.519
MIEMDD	0.751	0.502
QUICKDD	0.729	0.726
MILR	0.599	0.562
MISVM	0.523	0.523
BOOST	0.498	0.498
WRAPPER	0.498	0.498
KNN	0.497	0.498
SIMPLEMI	0.494	0.498

Weka Explorer

Preprocess **Classify** Cluster Associate Select attributes Visualize Auto-WEKA DI4J Inference CPython Scripting

Classifier

Choose **TLC** -P "weka.classifiers.trees.J48 -C 0.25 -M 2" -W weka.classifiers.meta.LogitBoost --P 100 -L -1.7976931348623157E308 -H 1.0 -Z 3.0 -O 1 -E 1 -S 1 -I 10 -W weka.classifiers.trees.J48

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)

- 16:24:28 - ml.MISVM
- 16:43:05 - ml.MITI
- 16:43:59 - ml.MIWrapper
- 16:44:24 - ml.QuickDDIterative
- 16:45:12 - ml.SimpleML
- 16:45:45 - ml.TLC**

Classifier output

Iteration 10
Class 1 (class=APK_GET)

Decision Stump

Classifications

partition_28 <= 0.5 : 0.12661326793531938
partition_28 > 0.5 : -1.3567621568437895
partition_28 is missing : -9.507747005610818E-4

Two-class case: second classifier predicts additive inverse of first classifier and is not explicitly computed.

Number of performed iterations: 10

Time taken to build model: 0.4 seconds

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

Correctly Classified Instances	472	97.9253 %
Incorrectly Classified Instances	10	2.0747 %
Kappa statistic	0.9585	
Mean absolute error	0.0376	
Root mean squared error	0.137	
Relative absolute error	7.519 %	
Root relative squared error	27.4036 %	
Total Number of Instances	482	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.979	0.021	0.979	0.979	0.979	0.959	0.990	0.990	APK_GET
	0.979	0.021	0.979	0.979	0.979	0.959	0.990	0.989	APK_PUT
Weighted Avg.	0.979	0.021	0.979	0.979	0.979	0.959	0.990	0.990	

=== Confusion Matrix ===

a	b	-- classified as
236	5	a = APK_GET
5	236	b = APK_PUT

Weka Explorer

Preprocess **Classify** Cluster Associate Select attributes Visualize Auto-WEKA DI4J Inference CPython Scripting

Classifier

Choose **QuickDDIterative** -N 1 -S 1.0 -M 1.0 -I 1

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)

- 16:24:28 - ml.MISVM
- 16:43:05 - ml.MITI**
- 16:43:59 - ml.MIWrapper
- 16:44:24 - ml.QuickDDIterative

Classifier output

Number of positive rules: 160.0
Number of conditions in positive rules: 7141.0

Time taken to build model: 0.14 seconds

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

Correctly Classified Instances	468	97.0954 %
Incorrectly Classified Instances	14	2.9046 %
Kappa statistic	0.9419	
Mean absolute error	0.029	
Root mean squared error	0.1704	
Relative absolute error	5.6091 %	
Root relative squared error	34.0852 %	
Total Number of Instances	482	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.963	0.021	0.979	0.963	0.971	0.942	0.971	0.961	APK_GET
	0.979	0.037	0.963	0.979	0.971	0.942	0.971	0.954	APK_PUT
Weighted Avg.	0.971	0.029	0.971	0.971	0.971	0.942	0.971	0.957	

=== Confusion Matrix ===

a	b	-- classified as
232	9	a = APK_GET
5	236	b = APK_PUT

Status

OK

Weka Explorer

Preprocess | Classify | Cluster | Associate | Select attributes | Visualize | Auto-WEKA | D4j Inference | CPython Scripting

Classifier

Choose MIRI -K 5 -Ba 0.5 -M 2 -A -1 -An 1 -S 1

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)

- 09:44:16 - mi.CitationKNN
- 09:44:45 - mi.MDD
- 09:46:48 - mi.MIBoost
- 09:46:54 - mi.MIDD
- 09:56:29 - mi.MIEMDD
- 09:57:19 - mi.MILR
- 09:57:28 - mi.MINND
- 16:20:16 - mi.MIOptimalBall
- 16:20:21 - mi.MIRI

Classifier output

```
| | mfcc1 <= -72.99 : 32 [32 / 0] (+)
1961 [40 / 1921]
mfcc1 > -42.78 : 3 [2 / 1]
| | chroma_stft > 0.1278 : 2 [2 / 0] (+)
1945 [24 / 1921]
mfcc6 <= -0.1345 : 1 [1 / 0] (+)
1937 [16 / 1921]
mfcc15 > 4.355 : 1917 [15 / 1902]
| | mfcc3 > -47.59 : 1834 [13 / 1821]
| | mfcc15 > 5.424 : 1449 [8 / 1441]
| | | mfcc12 > 0.3764 : 166 [2 / 164]
| | | | chroma_stft <= 0.1295 : 5 [2 / 3]
| | | | rolloff <= 1601 : 2 [2 / 0] (+)
```

Number of positive rules: 7.0
Number of conditions in positive rules: 137.0

Time taken to build model: 0.2 seconds

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

Correctly Classified Instances	465	96.473 %
Incorrectly Classified Instances	17	3.527 %
Kappa statistic	0.9295	
Mean absolute error	0.0353	
Root mean squared error	0.1878	
Relative absolute error	7.0539 %	
Root relative squared error	37.5601 %	
Total Number of Instances	482	

=== 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	0.929	0.965	0.949	APK_GET
	0.967	0.037	0.963	0.967	0.965	0.929	0.965	0.947	APK_PUT
Weighted Avg.	0.965	0.035	0.965	0.965	0.965	0.929	0.965	0.948	

=== Confusion Matrix ===

```
a b <-- classified as
232 9 | a = APK_GET
8 233 | b = APK_PUT
```

Preprocess | Classify | Cluster | Associate | Select attributes | Visualize | Auto-WEKA | D4j Inference | CPython Scripting

Classifier

Choose MIDD -N 1

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)

- 09:44:16 - mi.CitationKNN
- 09:44:45 - mi.MDD
- 09:46:48 - mi.MIBoost
- 09:46:54 - mi.MIDD

Classifier output

```
mfcc4 -0.7113 16.2592
mfcc5 -0.7883 0
mfcc6 -0.4778 -0
mfcc7 2.5931 0
mfcc8 -1.8138 -0
mfcc9 0.3249 -0
mfcc10 0.777 0
mfcc11 0.7862 -0
mfcc12 0.7805 -0
mfcc13 -0.7285 -0
mfcc14 -0.7362 0
mfcc15 -3.3467 -0
mfcc16 4.4963 0
mfcc17 1.7517 0
mfcc18 9.9644 0
mfcc19 1.8162 -0
mfcc20 -0.6865 0
```

Time taken to build model: 62.79 seconds

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

Correctly Classified Instances	415	86.0996 %
Incorrectly Classified Instances	67	13.9004 %
Kappa statistic	0.722	
Mean absolute error	0.2683	
Root mean squared error	0.3447	
Relative absolute error	53.6641 %	
Root relative squared error	68.9353 %	
Total Number of Instances	482	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.967	0.245	0.798	0.967	0.874	0.739	0.894	0.813	APK_GET
	0.755	0.033	0.958	0.755	0.845	0.739	0.894	0.915	APK_PUT
Weighted Avg.	0.861	0.139	0.878	0.861	0.859	0.739	0.894	0.864	

=== Confusion Matrix ===

```
a b <-- classified as
233 8 | a = APK_GET
59 182 | b = APK_PUT
```

Weka Explorer

Preprocess Classify Cluster Associate Select attributes Visualize Auto-WEKA DI4J Inference CPython Scripting

Classifier

Choose MIDD -N 1

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)

- 09:44:16 - mi.CitationKNN
- 09:44:45 - mi.MDD
- 09:46:48 - mi.MIBoost
- 09:46:54 - mi.MIDD

Classifier output

mfcc4 -0.2914 21.9267

mfcc5 -0.6299 19.0685

mfcc6 -2.1924 39.3427

mfcc7 -1.4372 26.721

mfcc8 -0.0443 31.4709

mfcc9 -0.1771 31.8581

mfcc10 0.4402 22.9443

mfcc11 0.2922 26.6879

mfcc12 0.7298 23.2978

mfcc13 -0.045 31.7653

mfcc14 -0.0653 20.3878

mfcc15 1.2327 31.672

mfcc16 3.2176 43.0974

mfcc17 -2.3511 21.9761

mfcc18 1.3689 21.9321

mfcc19 -0.572 1.0351

mfcc20 -0.7514 24.3698

Time taken to build model: 12.84 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 343 71.1618 %

Incorrectly Classified Instances 139 28.8382 %

Kappa statistic 0.4232

Mean absolute error 0.4961

Root mean squared error 0.4967

Relative absolute error 99.2103 %

Root relative squared error 99.3295 %

Total Number of Instances 482

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.988	0.564	0.636	0.988	0.774	0.508	0.664	0.542	APK_GET
	0.436	0.012	0.972	0.436	0.602	0.508	0.664	0.771	APK_PUT
Weighted Avg.	0.712	0.288	0.804	0.712	0.688	0.508	0.664	0.657	

=== Confusion Matrix ===

a b <-- classified as

238 3 | a = APK_GET

136 105 | b = APK_PUT

Weka Explorer

Preprocess Classify Cluster Associate Select attributes Visualize Auto-WEKA DI4J Inference CPython Scripting

Classifier

Choose TLDSimple -R 1 -S 1

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)

- 16:24:28 - mi.MISVM
- 16:43:05 - mi.MIT
- 16:43:59 - mi.MWrapper
- 16:44:24 - mi.QuickDDIterative
- 16:45:12 - mi.SimpleML
- 16:45:45 - mi.TLC
- 16:46:08 - mi.TLD
- 16:46:18 - mi.TLDSimple

Classifier output

Negative: sigma^2=2.0351902709581022, w=1.0E-12, m=-1.6159463878930953

mfcc17

Positive: sigma^2=3.0937682471281622, w=1.0E-12, m=-20.276106934618312

Negative: sigma^2=2.967213223143656, w=1.0E-12, m=-20.311360903794043

mfcc18

Positive: sigma^2=129.68555288394467, w=1.0E-12, m=-10.028008369697329

Negative: sigma^2=131.41213573427754, w=1.0E-12, m=-10.048248222255223

mfcc19

Positive: sigma^2=2.2242879356791216, w=1.0E-12, m=3.9752807745500864

Negative: sigma^2=2.237356806717866, w=1.0E-12, m=3.9871662726692736

mfcc20

Positive: sigma^2=274.0201285788678, w=1.0E-12, m=11.151683990480922

Negative: sigma^2=276.6473153441677, w=1.0E-12, m=11.211704328264469

Time taken to build model: 0.03 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 250 51.8672 %

Incorrectly Classified Instances 232 48.1328 %

Kappa statistic 0.0373

Mean absolute error 0.4813

Root mean squared error 0.6938

Relative absolute error 96.2646 %

Root relative squared error 138.7542 %

Total Number of Instances 482

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	1.000	0.963	0.510	1.000	0.675	0.138	0.523	0.512	APK_GET
	0.037	0.000	1.000	0.037	0.072	0.138	0.523	0.523	APK_PUT
Weighted Avg.	0.519	0.481	0.755	0.519	0.374	0.138	0.523	0.517	

=== Confusion Matrix ===

a b <-- classified as

241 0 | a = APK_GET

232 9 | b = APK_PUT

