Tugas 1 IF4071

Source Code

Source code dilampirkan didalam folder src.

Hasil Eksekusi Terhadap Data Tes

```
_____
Data Set : iris.arff
Classifier : ID3 Weka
______
Exception in thread "main" weka.core.UnsupportedAttributeTypeException:
weka.classifiers.trees.Id3: Cannot handle numeric attributes!
    at weka.core.Capabilities.test(Capabilities.java:954)
    at weka.core.Capabilities.test(Capabilities.java:869)
    at weka.core.Capabilities.test(Capabilities.java:1085)
    at weka.core.Capabilities.test(Capabilities.java:1023)
    at weka.core.Capabilities.testWithFail(Capabilities.java:1302)
    at weka.classifiers.trees.Id3.buildClassifier(Id3.java:166)
    at com.company.WekaJava.buildClassifier(WekaJava.java:130)
    at com.company.Main.main(Main.java:18)
    at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java
:62)
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorI
mpl.java:43)
    at java.lang.reflect.Method.invoke(Method.java:497)
com.intellij.rt.execution.application.AppMain.main(AppMain.java:140)
_____
Data Set : iris.arff
Classifier : J48 Weka
______
=== Test Evaluation ===
Correctly Classified Instances
                                147
                                               98
                               3
Incorrectly Classified Instances
Kappa statistic
                                 0.97
Mean absolute error
                                 0.0233
                                0.108
Root mean squared error Relative absolute error
                                 5.2482 %
                               22.9089 %
Root relative squared error
Total Number of Instances
                               150
=== Detailed Accuracy By Class ===
            TP Rate FP Rate Precision Recall F-Measure ROC
Area Class
                              1
              1 0
                                      1
                                                1
Iris-setosa
             0.98 0.02 0.961 0.98 0.97
                                                        0.99
Iris-versicolor
             0.96 0.01 0.98 0.96 0.97
                                                         0.99
Iris-virginica
Weighted Avg. 0.98 0.01 0.98
                                       0.98
                                                0.98
0.993
```

=== Confusion Matrix ===					
a b c < classification of the second of th	tosa rsicolor				
=== 10-fold cross valida	tion ===				
Correctly Classified Instance Incorrectly Classified Incorrectly Cla	144 6 0.94 0.035 0.158 7.870 33.635	5 36)5 %	96 4	00 00	
=== Detailed Accuracy By	Class ===	=			
TP Rate Area Class	FP Rate	Precision	Recall	F-Measure	ROC
0.98	0	1	0.98	0.99	0.99
Iris-setosa 0.94	0.03	0.94	0.94	0.94	
0.952 Iris-versicolor 0.96	0.03	0.941	0.96	0.95	
0.961 Iris-virginica Weighted Avg. 0.96 0.968	0.02	0.96	0.96	0.96	
=== Confusion Matrix ===					
a b c < classification a = Iris-se 0 47 3 b = Iris-ve 0 2 48 c = Iris-vi	tosa rsicolor				
=== percentage split 70.	0% ===				
Correctly Classified Instance Incorrectly Classified In Kappa statistic Mean absolute error Root mean squared error Relative absolute error Root relative squared er Total Number of Instance	nstances	43 2 0.933 0.041 0.168 9.346 35.655	16 32 56 %	95.5556 4.4444	
=== Detailed Accuracy By	Class ===	=			
TP Rate Area Class	FP Rate	Precision	Recall	F-Measure	ROC
1 Iris-setosa	0	1	1	1	1
1	0.069	0.889	1	0.941	
0.966 Iris-versicolor 0.867 0.964 Iris-virginica	0	1	0.867	0.929	

```
Weighted Avg.
             0.956 0.025
                                0.96
                                        0.956
                                                 0.955
0.976
=== Confusion Matrix ===
 a b c <-- classified as
14
   Ω
      0 | a = Iris-setosa
 0 \ 16 \ 0 \ | \ b = Iris-versicolor
   2 13 | c = Iris-virginica
_____
Data Set : iris.arff
Classifier : CustomID3
______
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 5
com.company.CustomID3.distributionForInstance(CustomID3.java:378)
    at.
com.company.CustomID3.distributionForInstance(CustomID3.java:379)
weka.classifiers.Evaluation.evaluateModelOnceAndRecordPrediction(Evaluati
on.java:1512)
     at weka.classifiers.Evaluation.evaluateModel(Evaluation.java:1480)
     at com.company.WekaJava.testModel(WekaJava.java:69)
     at com.company.Main.main(Main.java:20)
     at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java
:62)
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorI
mpl.java:43)
     at java.lang.reflect.Method.invoke(Method.java:497)
com.intellij.rt.execution.application.AppMain.main(AppMain.java:140)
______
Data Set : iris.arff
Classifier : CustomC45
______
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 3
com.company.CustomC45.distributionForInstance(CustomC45.java:394)
weka.classifiers.Evaluation.evaluateModelOnceAndRecordPrediction(Evaluati
on.java:1512)
     at weka.classifiers.Evaluation.evaluateModel(Evaluation.java:1480)
     at com.company.WekaJava.testModel(WekaJava.java:69)
     at com.company.Main.main(Main.java:20)
     at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java
:62)
     at.
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorI
mpl.java:43)
     at java.lang.reflect.Method.invoke(Method.java:497)
     at
com.intellij.rt.execution.application.AppMain.main(AppMain.java:140)
______
Data Set : weather.nominal.arff
Classifier : ID3 Weka
_____
```

=== Test Evalu	ation ===							
Correctly Clas Incorrectly Cl Kappa statisti Mean absolute Root mean squa Relative absol Root relative Total Number o	sified Insassified I cerror red error ute error squared er	Instances	14 0 1 0 0 0 0	olo alo	100	000000		
=== Detailed Accuracy By Class ===								
	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC		
Area Class	1	0	1	1	1	1		
yes	1	0	1	1	1	1		
no Weighted Avg.	1	0	1	1	1	1		
=== Confusion	Matrix ===	=						
	a b < classified as 9 0 a = yes							
=== 10-fold cr	oss valida	ation ===						
Correctly Classified Instances Incorrectly Classified Instances Kappa statistic Mean absolute error Root mean squared error Relative absolute error Root relative squared error Total Number of Instances			12 2 0.68 0.14 0.37 30 76.60	29 8 %	85.7143 14.2857			
=== Detailed A	ccuracy By	Class ===	=					
7	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC		
Area Class	0.889	0.2	0.889	0.889	0.889			
0.844 yes	0.8	0.111	0.8	0.8	0.8			
0.844 no Weighted Avg. 0.844	0.857	0.168	0.857	0.857	0.857			
=== Confusion Matrix ===								
<pre>a b < classified as 8 1 a = yes 1 4 b = no</pre>								
=== percentage	split 70.	0% ===						
Correctly Classified Instances Incorrectly Classified Instances Kappa statistic Mean absolute error			2 2 0 0.5		50 50	oo oo		

Root mean squa Relative absol Root relative Total Number o	ute error squared er		0.70 100 134.16	용		
=== Detailed A	ccuracy By	Class ===	=			
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC
	1	1	0.5	1	0.667	0.5
yes	0	0	0	0	0	0.5
no Weighted Avg.	0.5	0.5	0.25	0.5	0.333	0.5
=== Confusion	Matrix ===	=				
a b < cla 2 0 a = yes 2 0 b = no	3				========	==
Data Set : wea	748 Weka					==
=== Test Evalu						
Correctly Class Incorrectly Cl Kappa statisti Mean absolute Root mean squa Relative absol Root relative Total Number of	assified I c error ared error ute error squared er	instances cror	14 0 1 0 0 0 0	00000	100	0,000
=== Detailed A	ccuracy By	Class ===	=			
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC
yes	1	0	1	1	1	1
no	1	0	1	1	1	1
Weighted Avg.	1	0	1	1	1	1
=== Confusion	Matrix ===	=				
a b < cla 9 0 a = yes 0 5 b = no		3				
=== 10-fold cr	coss valida	ation ===				
Correctly Class Incorrectly Cl Kappa statisti Mean absolute Root mean squa Relative absolutorotal Number of	assified I c error ared error ute error squared er	nstances	7 7 -0.04 0.41 0.59 87.5 121.29	67 84 %	50 50	90 90

=== Detailed Accuracy By Class ===								
7 mag Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC		
Area Class	0.556	0.6	0.625	0.556	0.588			
0.633 yes	0.4	0.444	0.333	0.4	0.364			
0.633 no Weighted Avg. 0.633	0.5	0.544	0.521	0.5	0.508			
=== Confusion I	Matrix ===	=						
a b < clas 5 4 a = yes 3 2 b = no	ssified as	3						
=== percentage	split 70.	0% ===						
Correctly Class Incorrectly Class Kappa statistic Mean absolute of Root mean squas Relative absolut Root relative of Total Number of	assified I c error red error ute error squared er	nstances	1 3 -0.5 0.75 0.866 150 164.316	용	25 75	o 6 o 6 o 6		
=== Detailed A	ccuracy By	Class ===	=					
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC		
yes	0.5	1	0.333	0.5	0.4	0.25		
no	0	0.5	0	0	0	0.25		
Weighted Avg.	0.25	0.75	0.167	0.25	0.2	0.25		
=== Confusion 1	Matrix ===	=						
a b < clas 1 1 a = yes 2 0 b = no								
Data Set : wear	ther.nominustomID3	nal.arff						
=== Test Evalua								
Correctly Class Incorrectly Class Incorrectly Class Mappa statistic Mean absolute Root mean squas Relative absolute Root relative State Total Number of	14 0 1 0 0 0 0 0	00 00	100	0 0 0				
=== Detailed A	ccuracy By	Class ===	=					

	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	
Area Class	1	0	1	1	1	1	
yes	1	0	1	1	1	1	
no Weighted Avg.	1	0	1	1	1	1	
=== Confusion	Matrix ===	=					
a b < cla 9 0 a = yes 0 5 b = no		5					
=== 10-fold cr	coss valida	ation ===					
Correctly Class Incorrectly Class Incorrectly Class Rean absolute Root mean squarelative absolution Root relative Total Number of	assified 1 .c error ared error .ute error squared en	Instances	12 2 0.688 0.142 0.378 30 76.609	29 8 %	85.7143 14.2857		
=== Detailed A	Accuracy By	/ Class ===	=				
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	
0.844 yes	0.889	0.2	0.889	0.889	0.889		
0.844 no	0.8	0.111	0.8	0.8	0.8		
Weighted Avg. 0.844	0.857	0.168	0.857	0.857	0.857		
=== Confusion	Matrix ===	=					
a b < cla 8 1 a = yes 1 4 b = no		5					
=== percentage	e split 70.	.0% ===					
Correctly Class Incorrectly Class Incorrectly Class Reparks statistic Mean absolute Root mean squarelative absolute Root relative Total Number of	assified 1 .c error ared error .ute error squared en	Instances	2 0 0.5 0.70 100 134.16	%	50 50	00 00	
=== Detailed Accuracy By Class ===							
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	
yes	1	1	0.5	1	0.667	0.5	
no	0	0	0	0	0	0.5	
L							

Weighted Avg.	0.5	0.5	0.25	0.5	0.333	0.5	
=== Confusion N	Matrix ===	=					
2 0 a = yes 2 0 b = no	ssified as						
Data Set : weat	ther.nomin					=	
=== Test Evalua	======= ation ===		=======	======	=======	=	
Correctly Class Incorrectly Cla Kappa statistic Mean absolute of Root mean squar Relative absolut Root relative statistics	assified I error ced error ite error squared er	nstances	14 0 1 0 0 0 0 0	o o o o o	100	ଚ ଚ	
=== Detailed Ad	ccuracy By	Class ===	=				
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	
yes	1	0	1	1	1	1	
no	1	0	1	1	1	1	
Weighted Avg.	1	0	1	1	1	1	
=== Confusion N a b < clas 9 0 a = yes 0 5 b = no							
=== 10-fold cro	oss valida	ation ===					
Correctly Classified Instances 11 78.5714 % Incorrectly Classified Instances 3 21.4286 % Kappa statistic 0.5532 Mean absolute error 0.2143 Root mean squared error 0.4629 Relative absolute error 45 % Root relative squared error 93.8273 % Total Number of Instances 14							
=== Detailed Accuracy By Class ===							
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	
	0.778	0.2	0.875	0.778	0.824		
	0.8	0.222	0.667	0.8	0.727		
0.789 no Weighted Avg. 0.789	0.786	0.208	0.801	0.786	0.789		
=== Confusion N	Matrix ===	=					

```
a b <-- classified as
7 \ 2 \ | \ a = yes
1 \ 4 \ | \ b = no
=== percentage split 70.0% ===
                                  1
Correctly Classified Instances
                                                25
Incorrectly Classified Instances
                                  3
                                                75
Kappa statistic
                                 -0.5
Mean absolute error
                                  0.75
Root mean squared error
                                  0.866
                                150
Relative absolute error
                               164.3168 %
Root relative squared error
Total Number of Instances
=== Detailed Accuracy By Class ===
            TP Rate FP Rate Precision Recall F-Measure ROC
Area Class
              0.5 1
                               0.333
                                       0.5 0.4
                                                         0.25
yes
                               0
                                                 0
              0
                      0.5
                                       0
                                                          0.25
no
                                                          0.25
             0.25
                     0.75
                               0.167 0.25 0.2
Weighted Avg.
=== Confusion Matrix ===
a b <-- classified as
1 \ 1 \ | \ a = yes
2 \ 0 \ | \ b = no
______
Data Set : weather.numeric.arff
Classifier : ID3 Weka
_____
Exception in thread "main" weka.core.UnsupportedAttributeTypeException:
weka.classifiers.trees.Id3: Cannot handle numeric attributes!
     at weka.core.Capabilities.test(Capabilities.java:954)
     at weka.core.Capabilities.test(Capabilities.java:869)
     at weka.core.Capabilities.test(Capabilities.java:1085)
     at weka.core.Capabilities.test(Capabilities.java:1023)
     at weka.core.Capabilities.testWithFail(Capabilities.java:1302)
     at weka.classifiers.trees.Id3.buildClassifier(Id3.java:166)
     at com.company.WekaJava.buildClassifier(WekaJava.java:130)
     at com.company.Main.main(Main.java:18)
     at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java
:62)
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorI
mpl.java:43)
     at java.lang.reflect.Method.invoke(Method.java:497)
     at
com.intellij.rt.execution.application.AppMain.main(AppMain.java:140)
______
Data Set : weather.numeric.arff
Classifier : J48 Weka
_____
=== Test Evaluation ===
```

Correctly Classified Instances Incorrectly Classified Instances Kappa statistic Mean absolute error Root mean squared error Relative absolute error Root relative squared error Total Number of Instances === Detailed Accuracy By Class ===			14 0 1 0 0 0 0 0	00 00	100	OP OO		
				D 11	- N	Dog		
Area Class	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC		
yes	1	0	1	1	1	1		
yes	1	0	1	1	1	1		
no Weighted Avg.	1	0	1	1	1	1		
=== Confusion	Matrix ===	=						
a b < cla 9 0 a = yes 0 5 b = no		5						
=== 10-fold cr	oss valida	ation ===						
Correctly Classified Instances Incorrectly Classified Instances Kappa statistic Mean absolute error Root mean squared error Relative absolute error Root relative squared error Total Number of Instances			9 5 0.186 0.285 0.483 60 97.658 14	57 18 ફ	64.2857 35.7143			
=== Detailed A				Dagali	T. Managemen	DOG		
Area Class	TP Rate				F-Measure	ROC		
0.789 yes	0.778	0.6	0.7	0.778	0.737			
0.789 no	0.4	0.222	0.5	0.4	0.444			
Weighted Avg. 0.789	0.643	0.465	0.629	0.643	0.632			
=== Confusion	Matrix ===	=						
a b < cla 7 2 a = yes 3 2 b = no		3						
=== percentage	=== percentage split 70.0% ===							
Correctly Clas Incorrectly Cl Kappa statisti Mean absolute Root mean squa Relative absol		1 3 -0.5 0.75 0.866		25 75	0,0 0,0			

```
Root relative squared error
                                 164.3168 %
Total Number of Instances
=== Detailed Accuracy By Class ===
             TP Rate FP Rate Precision Recall F-Measure ROC
Area Class
               0.5
                       1
                                 0.333
                                         0.5
                                                  0.4
                                                             0.25
yes
                       0.5
                                 0
                                          0
                                                   0
                                                             0.25
no
Weighted Avg. 0.25
                      0.75
                                0.167
                                         0.25 0.2
                                                             0.25
=== Confusion Matrix ===
a b <-- classified as
1 \ 1 \ | \ a = yes
2 \ 0 \ | \ b = no
_____
Data Set : weather.numeric.arff
Classifier : CustomID3
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 85
com.company.CustomID3.distributionForInstance(CustomID3.java:378)
com.company.CustomID3.distributionForInstance(CustomID3.java:379)
weka.classifiers.Evaluation.evaluateModelOnceAndRecordPrediction(Evaluati
on.java:1512)
     at weka.classifiers.Evaluation.evaluateModel(Evaluation.java:1480)
     at com.company.WekaJava.testModel(WekaJava.java:69)
     at com.company.Main.main(Main.java:20)
     at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java
:62)
     at
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorI
mpl.java:43)
     at java.lang.reflect.Method.invoke(Method.java:497)
com.intellij.rt.execution.application.AppMain.main(AppMain.java:140)
_____
Data Set : weather.numeric.arff
Classifier : CustomC45
______
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 85
com.company.CustomC45.distributionForInstance(CustomC45.java:394)
     at
weka.classifiers.Evaluation.evaluateModelOnceAndRecordPrediction(Evaluati
on.java:1512)
     at weka.classifiers.Evaluation.evaluateModel(Evaluation.java:1480)
     at com.company.WekaJava.testModel(WekaJava.java:69)
     at com.company.Main.main(Main.java:20)
     at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java
```

```
at
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorI
mpl.java:43)
at java.lang.reflect.Method.invoke(Method.java:497)
at
com.intellij.rt.execution.application.AppMain.main(AppMain.java:140)
```