

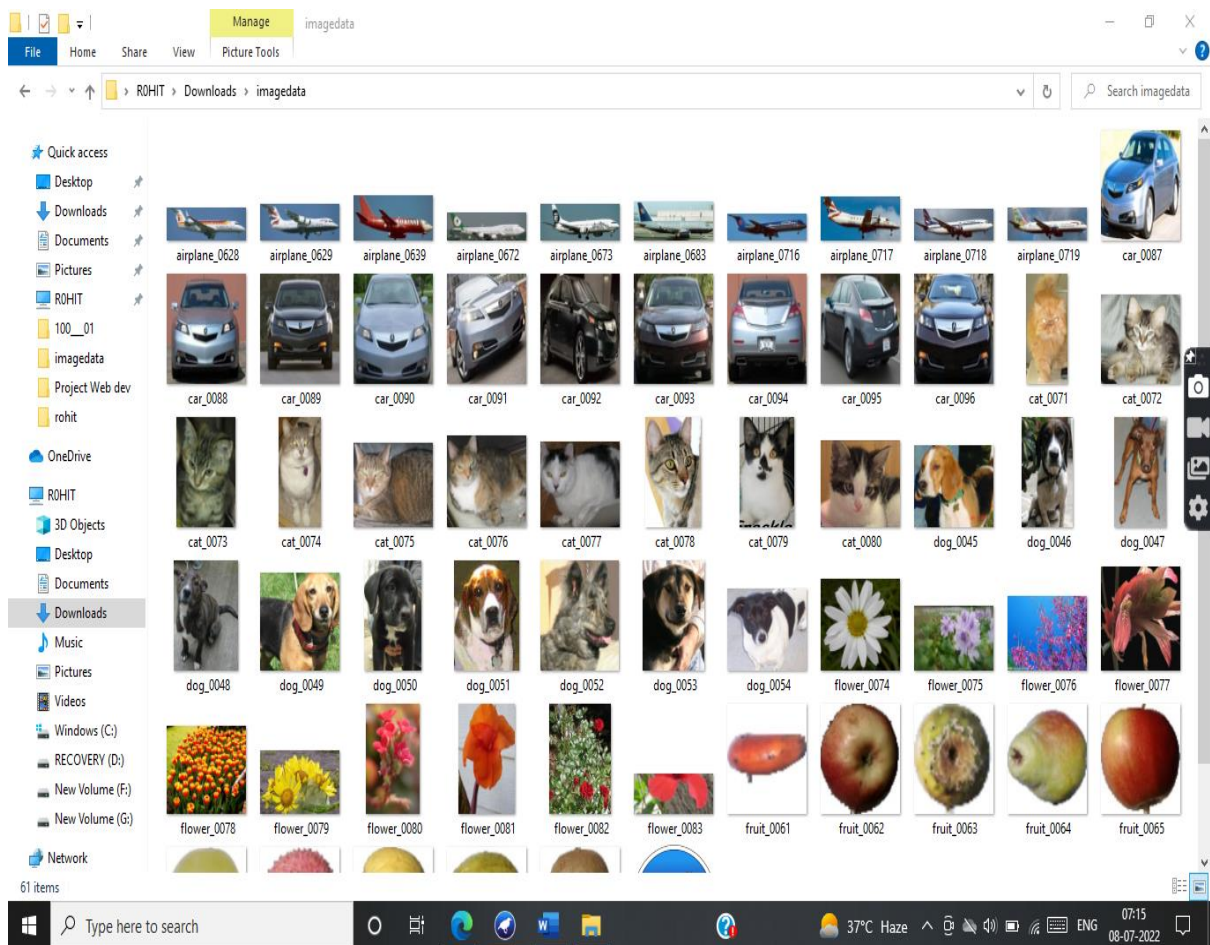
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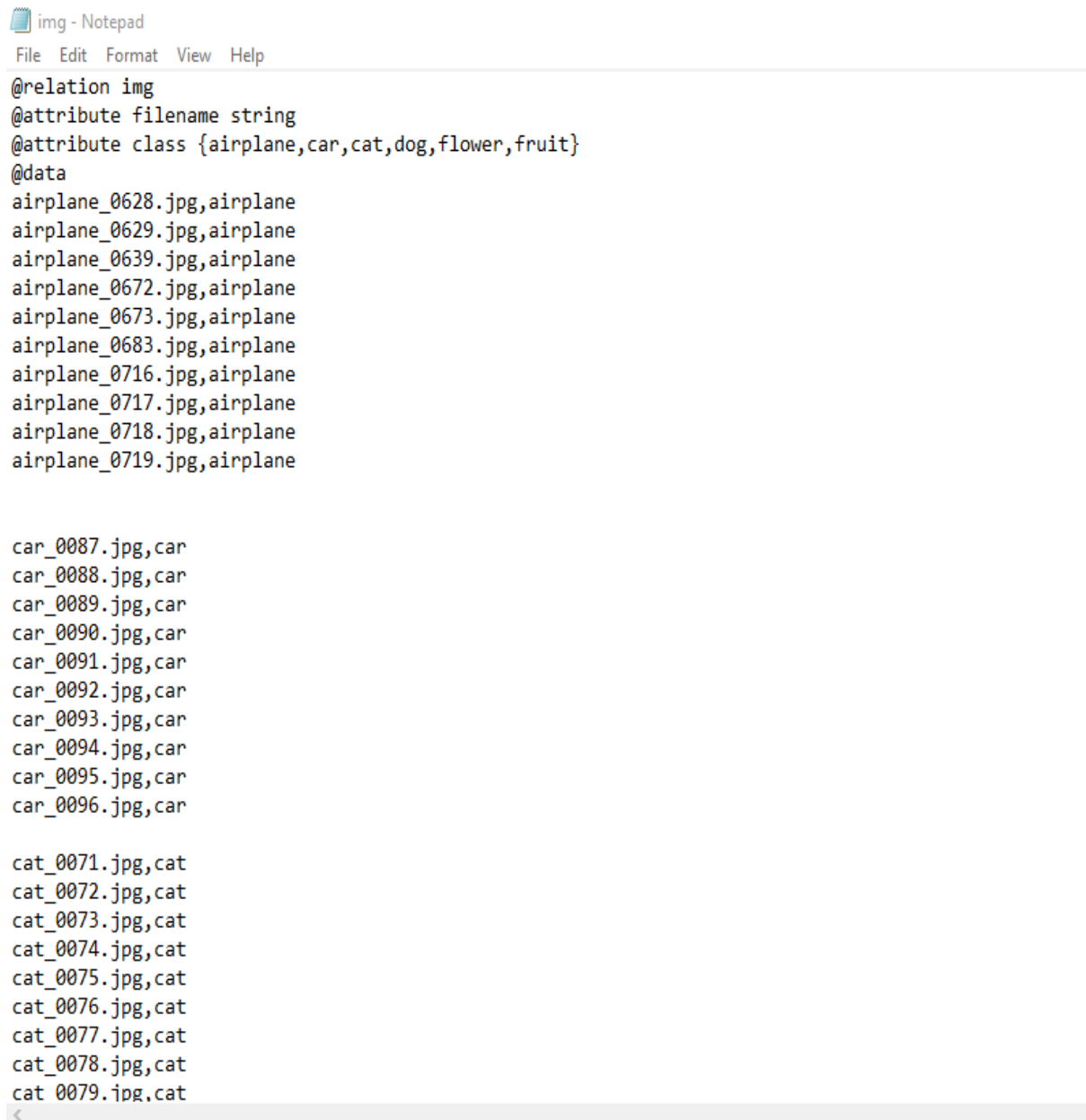
MCA SEM 4<sup>TH</sup>

## Image Classification Using Weka

### ◆ Collect dataset of images



## ◆ Prepare dataset file



```
img - Notepad
File Edit Format View Help
@relation img
@attribute filename string
@attribute class {airplane,car,cat,dog,flower,fruit}
@data
airplane_0628.jpg,airplane
airplane_0629.jpg,airplane
airplane_0639.jpg,airplane
airplane_0672.jpg,airplane
airplane_0673.jpg,airplane
airplane_0683.jpg,airplane
airplane_0716.jpg,airplane
airplane_0717.jpg,airplane
airplane_0718.jpg,airplane
airplane_0719.jpg,airplane

car_0087.jpg,car
car_0088.jpg,car
car_0089.jpg,car
car_0090.jpg,car
car_0091.jpg,car
car_0092.jpg,car
car_0093.jpg,car
car_0094.jpg,car
car_0095.jpg,car
car_0096.jpg,car

cat_0071.jpg,cat
cat_0072.jpg,cat
cat_0073.jpg,cat
cat_0074.jpg,cat
cat_0075.jpg,cat
cat_0076.jpg,cat
cat_0077.jpg,cat
cat_0078.jpg,cat
cat_0079.jpg,cat
```

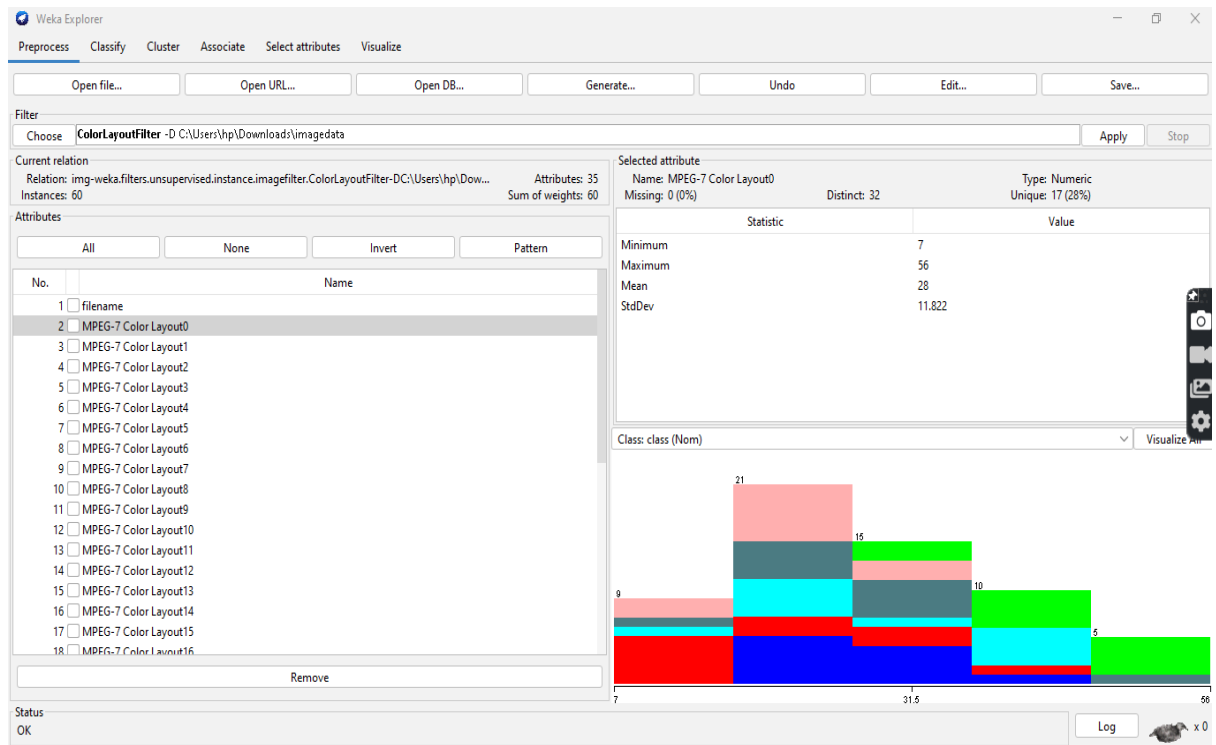
- file name save as '.arff' file e.g img.arff

## Open file in Weka

The screenshot shows the Weka Explorer application window. The 'Preprocess' tab is selected. The 'Filter' dropdown is set to 'ColorLayoutFilter -D "C:\\Program Files\\Weka-3-8-6"'. The 'Current relation' is 'img' with 60 instances. The 'Attributes' list shows 'filename' and 'class'. The 'Selected attribute' is 'class', which is nominal with 6 distinct values and 10 instances each. The 'Visualize' button is visible. Below the attribute list, a bar chart visualizes the distribution of the 'class' attribute, showing six bars of different colors (blue, red, cyan, grey, pink, green) representing the six classes.

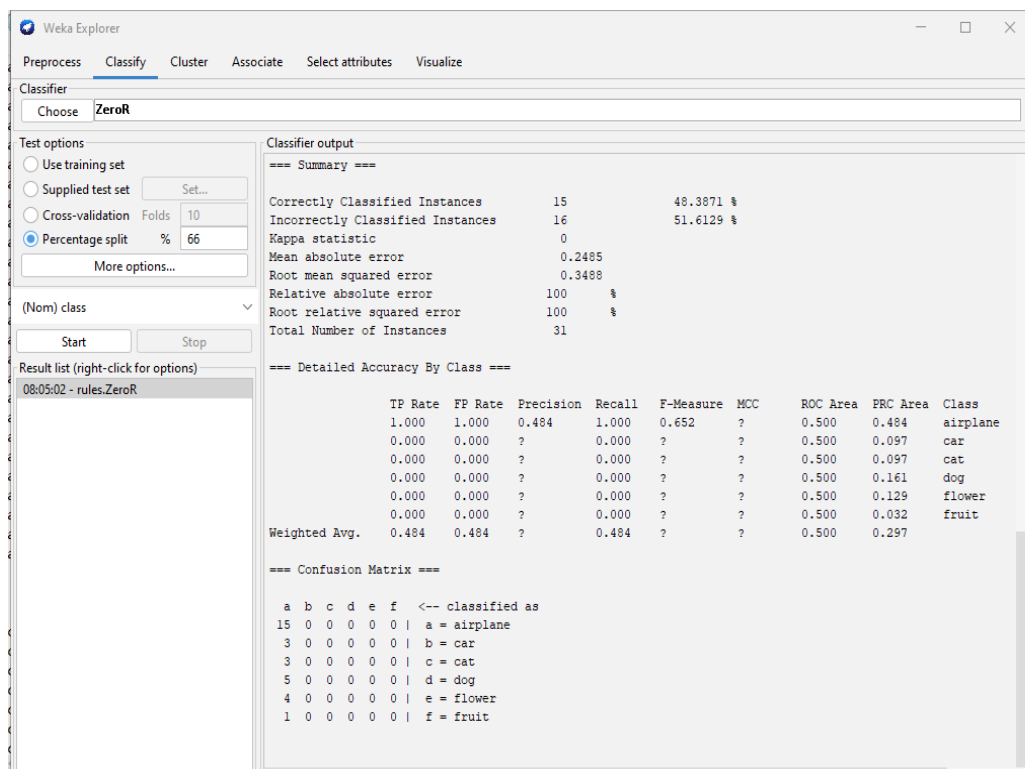
No.	Label	Count	Weight
1	airplane	10	10
2	car	10	10
3	cat	10	10
4	dog	10	10
5	flower	10	10
6	fruit	10	10

## Choose imagefilter(colorlayout filter) and apply



## Classification

- Test mode: split 66.0% train, remainder test



## • Test mode: split 70.0% train, remainder test

The screenshot shows the Weka Explorer interface with the 'Classify' tab selected. The 'Classifier' dropdown is set to 'ZeroR'. Under 'Test options', 'Percentage split' is selected with a value of 70%. The 'Result list' on the left shows two entries: '08:05:02 - rules.ZeroR' and '08:21:07 - rules.ZeroR'. The 'Classifier output' pane displays the following summary and detailed accuracy by class:

=== Summary ===

Metric	Value	Percentage
Correctly Classified Instances	14	51.8519 %
Incorrectly Classified Instances	13	48.1481 %
Kappa statistic	0	
Mean absolute error	0.2473	
Root mean squared error	0.346	
Relative absolute error	100	%
Root relative squared error	100	%
Total Number of Instances	27	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0.000	1.000	1.000	0.519	1.000	0.683	?	0.500	0.519	airplane
0.000	0.000	?	?	0.000	?	?	0.500	0.074	car
0.000	0.000	?	?	0.000	?	?	0.500	0.037	cat
0.000	0.000	?	?	0.000	?	?	0.500	0.185	dog
0.000	0.000	?	?	0.000	?	?	0.500	0.148	flower
0.000	0.000	?	?	0.000	?	?	0.500	0.037	fruit
Weighted Avg.	0.519	0.519	?	0.519	?	?	0.500	0.333	

=== Confusion Matrix ===

	a	b	c	d	e	f	<-- classified as
14	0	0	0	0	0	1	a = airplane
2	0	0	0	0	0	1	b = car
1	0	0	0	0	0	1	c = cat
5	0	0	0	0	0	1	d = dog
4	0	0	0	0	0	1	e = flower
1	0	0	0	0	0	1	f = fruit

## • Test mode: 10-fold cross-validation

The screenshot shows the Weka Explorer interface with the 'Classify' tab selected. The 'Classifier' dropdown is set to 'ZeroR'. Under 'Test options', 'Cross-validation' is selected with 'Folds' set to 10. The 'Result list' on the left shows three entries: '08:05:02 - rules.ZeroR', '08:21:07 - rules.ZeroR', and '08:23:05 - rules.ZeroR'. The 'Classifier output' pane displays the following summary and detailed accuracy by class:

=== Summary ===

Metric	Value	Percentage
Correctly Classified Instances	41	45.0549 %
Incorrectly Classified Instances	50	54.9451 %
Kappa statistic	0	
Mean absolute error	0.2478	
Root mean squared error	0.3505	
Relative absolute error	100	%
Root relative squared error	100	%
Total Number of Instances	91	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
1.000	1.000	0.451	1.000	0.621	?	?	0.489	0.445	airplane
0.000	0.000	?	?	0.000	?	?	0.494	0.109	car
0.000	0.000	?	?	0.000	?	?	0.494	0.109	cat
0.000	0.000	?	?	0.000	?	?	0.494	0.109	dog
0.000	0.000	?	?	0.000	?	?	0.494	0.109	flower
0.000	0.000	?	?	0.000	?	?	0.494	0.109	fruit
Weighted Avg.	0.451	0.451	?	0.451	?	?	0.492	0.260	

=== Confusion Matrix ===

	a	b	c	d	e	f	<-- classified as
41	0	0	0	0	0	1	a = airplane
10	0	0	0	0	0	1	b = car
10	0	0	0	0	0	1	c = cat
10	0	0	0	0	0	1	d = dog
10	0	0	0	0	0	1	e = flower
10	0	0	0	0	0	1	f = fruit

## • Test mode: 20-fold cross-validation

Weka Explorer

PreprocessClassifyClusterAssociateSelect attributesVisualize

Classifier

ChooseZeroR

Test options

Use training set

Supplied test set

Cross-validation

Folds20

Percentage split

%70

More options...

(Nom) class

StartStop

Result list (right-click for options)

08:05:02 - rules.ZeroR

08:21:07 - rules.ZeroR

08:23:05 - rules.ZeroR

08:26:45 - rules.ZeroR

08:26:53 - rules.ZeroR

08:27:04 - rules.ZeroR

08:27:13 - rules.ZeroR

08:27:38 - lazy.LWL

08:27:38 - meta.MultiClassClassifier

08:29:04 - rules.ZeroR

Classifier output

Correctly Classified Instances4145.0549 %

Incorrectly Classified Instances5054.9451 %

Mappa statistic0

Mean absolute error0.2486

Root mean squared error0.352

Relative absolute error100 %

Root relative squared error100 %

Total Number of Instances91

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	FRC Area	Class
	1.000	1.000	0.451	1.000	0.621	?	0.440	0.422	airplane
	0.000	0.000	?	0.000	?	?	0.247	0.110	car
	0.000	0.000	?	0.000	?	?	0.186	0.101	cat
	0.000	0.000	?	0.000	?	?	0.247	0.110	dog
	0.000	0.000	?	0.000	?	?	0.247	0.110	flower
	0.000	0.000	?	0.000	?	?	0.186	0.101	fruit
Weighted Avg.	0.451	0.451	?	0.451	?	?	0.320	0.249	

=== Confusion Matrix ===

a b c d e f

<-- classified as

41 0 0 0 0 0 | a = airplane

10 0 0 0 0 0 | b = car

10 0 0 0 0 0 | c = cat

10 0 0 0 0 0 | d = dog

10 0 0 0 0 0 | e = flower

10 0 0 0 0 0 | f = fruit

Status

OK

Log

x 0