Experiment-2.1

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Semester: 01
Date of Performance:
Subject Name: Artificial Intelligence Lab
Subject Code: 23CSH-621

Aim of the Experiment :

Aim of the Experiment is to download the recent research dataset from the UCI Machine learning repository and then train the 5 machine learning classifiers for choosing the best prediction model in WEKA.

Objective of the Experiment :

Task to be done for this experiment is that we have to download the recent research dataset from the UCI Machine learning repository and then train 5 machine learning classifiers for choosing the best prediction model. The 5 machine learning classifiers are:

a) ZeroR Classifier

b) Naive Bayes Classifier

c) Random Forest

d) J48 Classifier

e) KNN Classifier (IBk)

Algorithm/ Steps for Experiment :

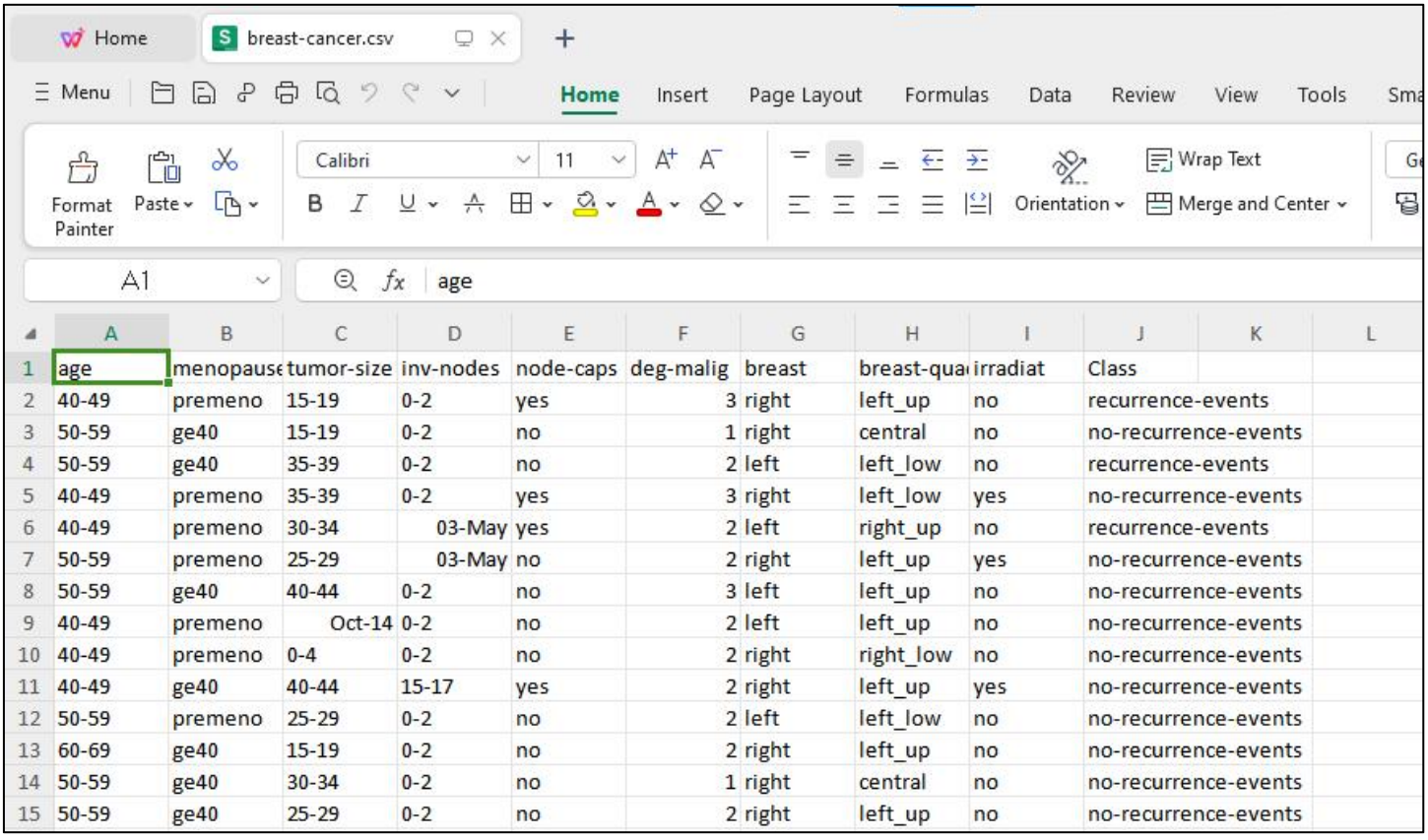
A) Tools to be used for given Dataset:

Step 1: Download the **Cancer dataset** from UCI Machine Learning repository.

Step 2: Open WEKA and instead of 'Explorer' tab, open the **'Experimenter'** tab.

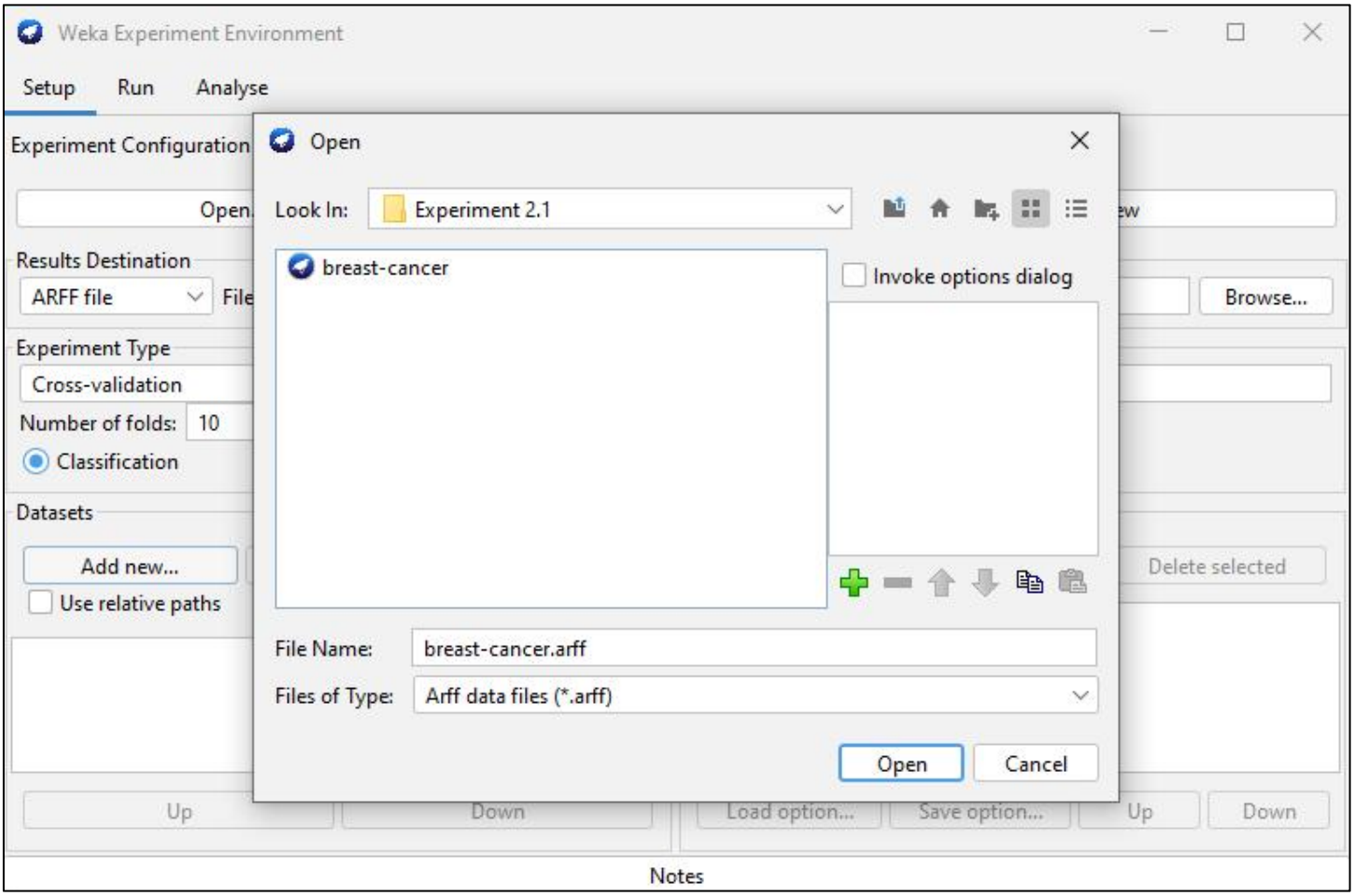
Step 3: Click on the **'New'** option to initiate the process of adding data.

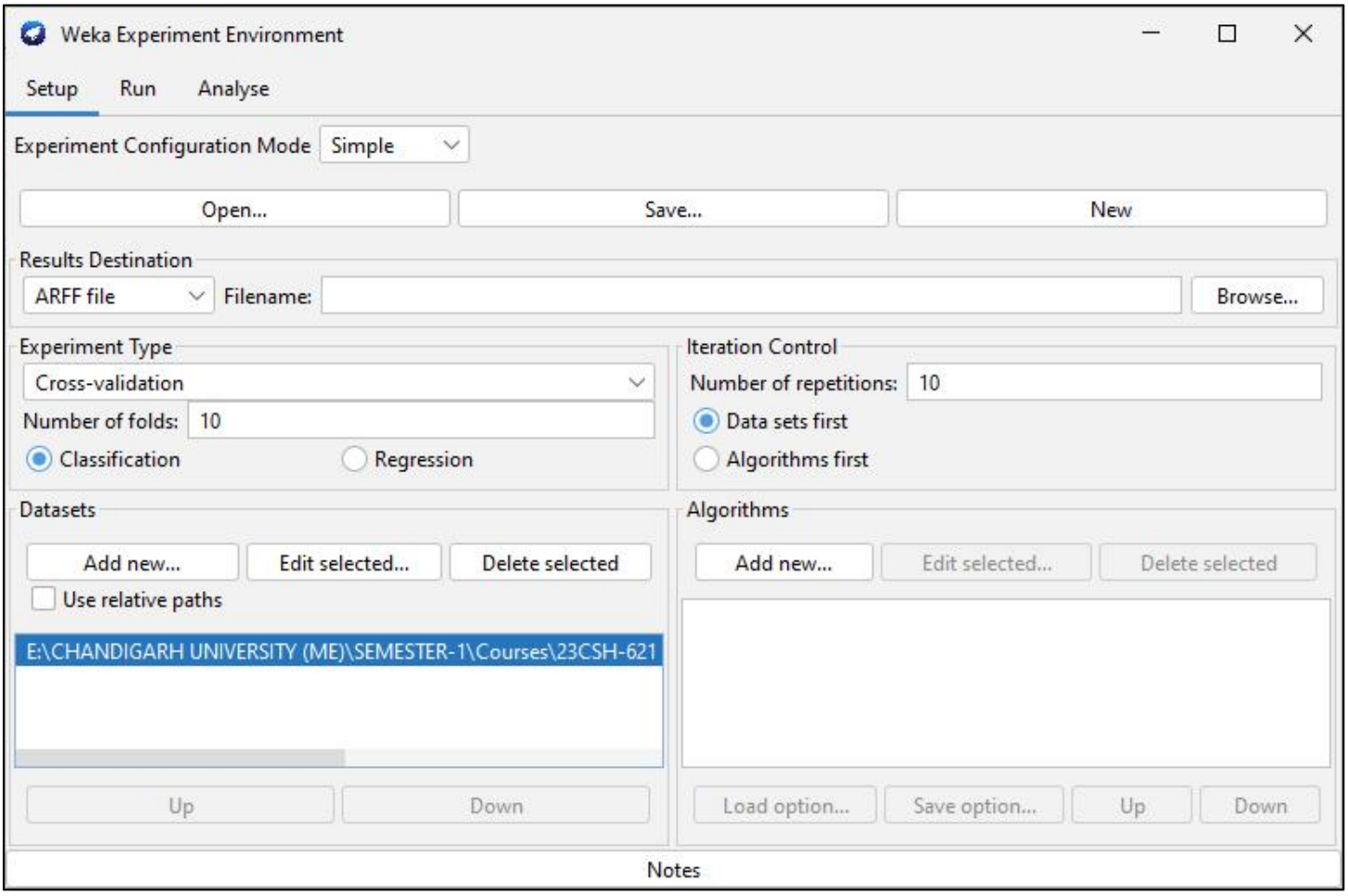
Step 4: In **'Datasets'** section, click on **'Add New'** option and select csv file to import.



	A	B	C	D	E	F	G	H	I	J	K	L
1	age	menopause	tumor-size	inv-nodes	node-caps	deg-malig	breast	breast-qua	irradiat	Class		
2	40-49	premeno	15-19	0-2	yes	3	right	left_up	no	recurrence-events		
3	50-59	ge40	15-19	0-2	no	1	right	central	no	no-recurrence-events		
4	50-59	ge40	35-39	0-2	no	2	left	left_low	no	recurrence-events		
5	40-49	premeno	35-39	0-2	yes	3	right	left_low	yes	no-recurrence-events		
6	40-49	premeno	30-34	03-May	yes	2	left	right_up	no	recurrence-events		
7	50-59	premeno	25-29	03-May	no	2	right	left_up	yes	no-recurrence-events		
8	50-59	ge40	40-44	0-2	no	3	left	left_up	no	no-recurrence-events		
9	40-49	premeno	Oct-14	0-2	no	2	left	left_up	no	no-recurrence-events		
10	40-49	premeno	0-4	0-2	no	2	right	right_low	no	no-recurrence-events		
11	40-49	ge40	40-44	15-17	yes	2	right	left_up	yes	no-recurrence-events		
12	50-59	premeno	25-29	0-2	no	2	left	left_low	no	no-recurrence-events		
13	60-69	ge40	15-19	0-2	no	2	right	left_up	no	no-recurrence-events		
14	50-59	ge40	30-34	0-2	no	1	right	central	no	no-recurrence-events		
15	50-59	ge40	25-29	0-2	no	2	right	left_up	no	no-recurrence-events		


Program
Visualization
Tools
Help
Weka GUI Chooser
Applications
Explorer
Experimenter
KnowledgeFlow
Workbench
Simple CLI
WEKA
THE UNIVERSITY OF WAIKATO
NEW ZEALAND
Waikato Environment for Knowledge Analysis
Version 3.8.6
(c) 1999 - 2022
The University of Waikato
Hamilton, New Zealand

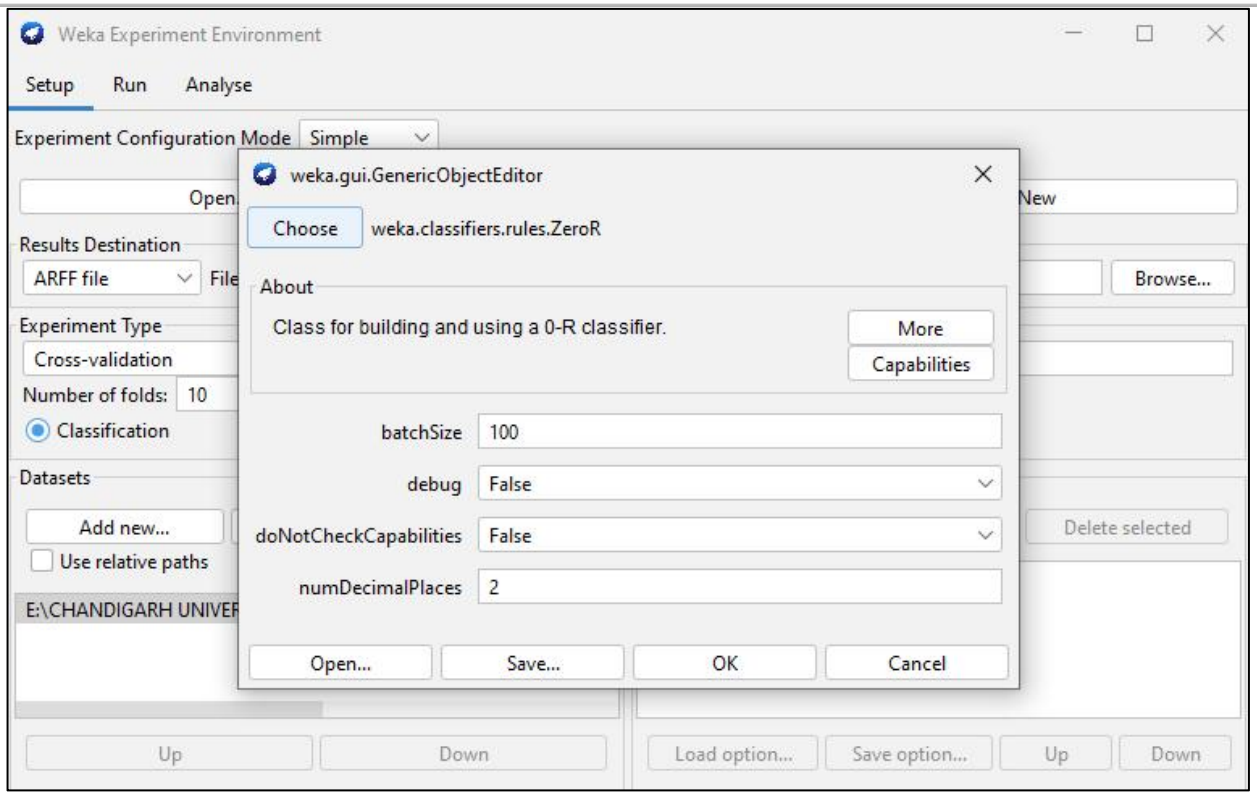

Weka Experiment Environment
Setup
Run
Analyse
Experiment Configuration
Open...
Results Destination
ARFF file
Experiment Type
Cross-validation
Number of folds: 10
Classification
Datasets
Add new...
Use relative paths
Delete selected
Up
Down
Load option...
Save option...
Up
Down
Notes
Open
Look In: Experiment 2.1
breast-cancer
Invoke options dialog
File Name: breast-cancer.arff
Files of Type: Arff data files (*.arff)
Open
Cancel
Browse...

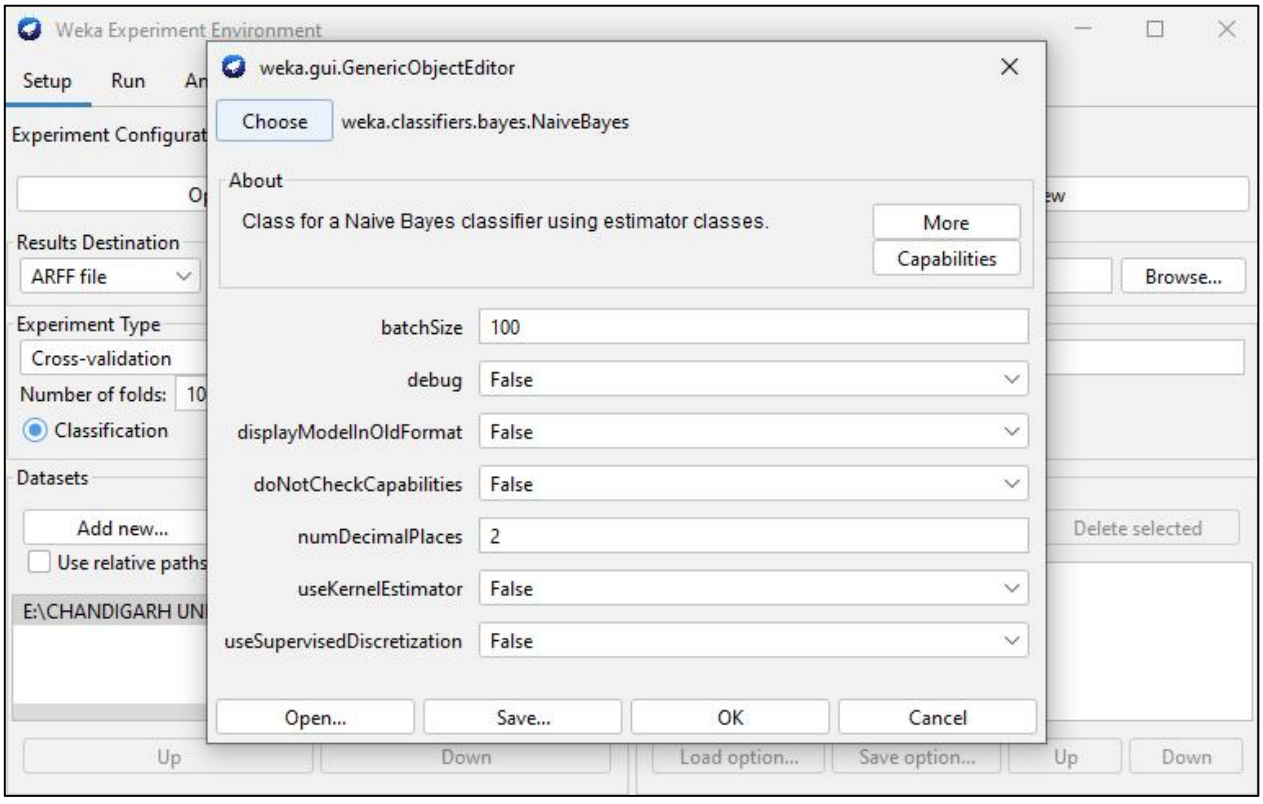


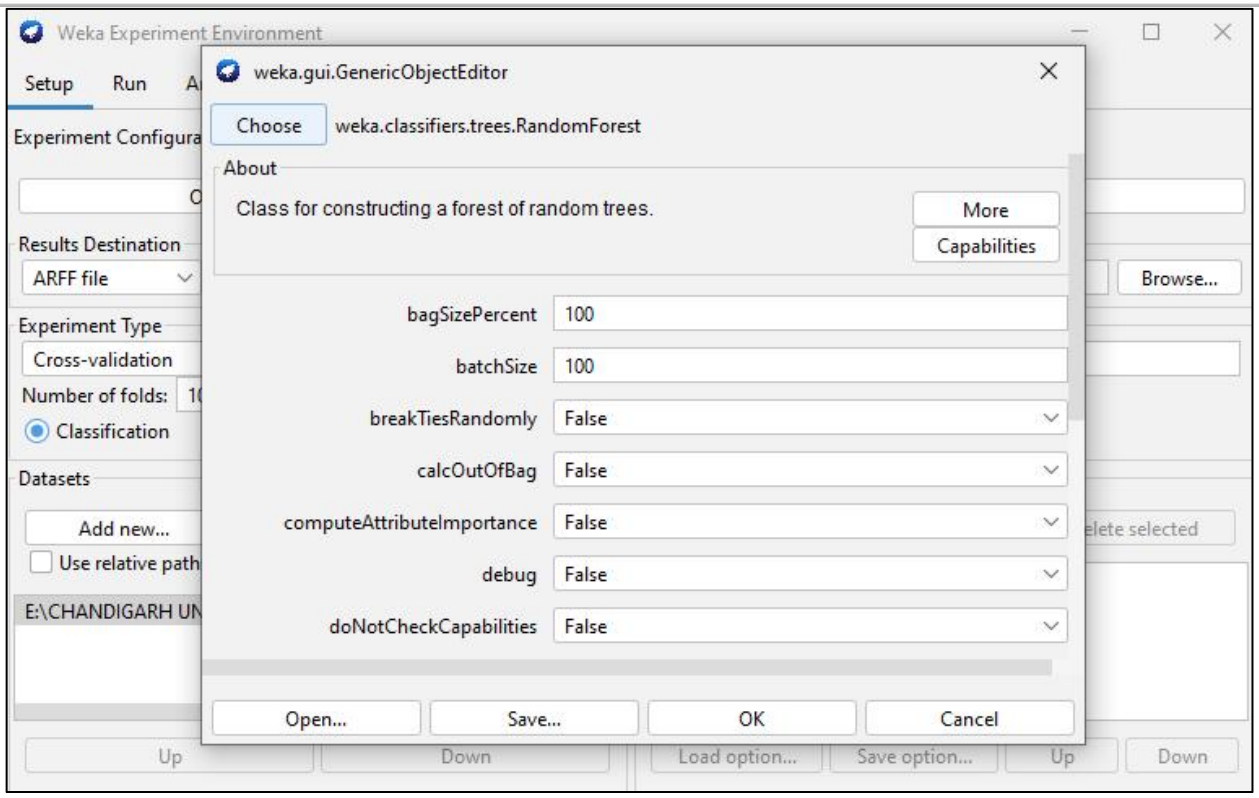
B) <u>Train 5 machine learning classifiers and choose the best prediction model:</u>

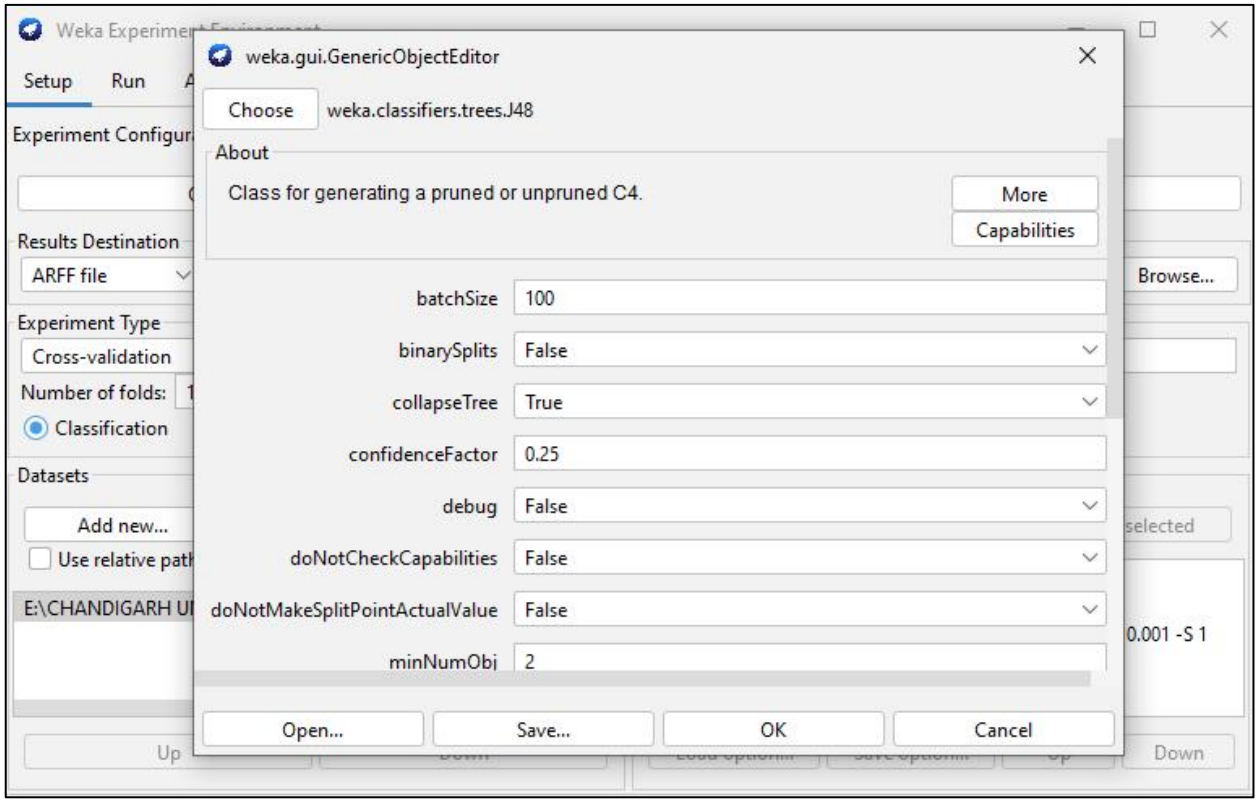
We can apply the 5 machine learning models as follows:

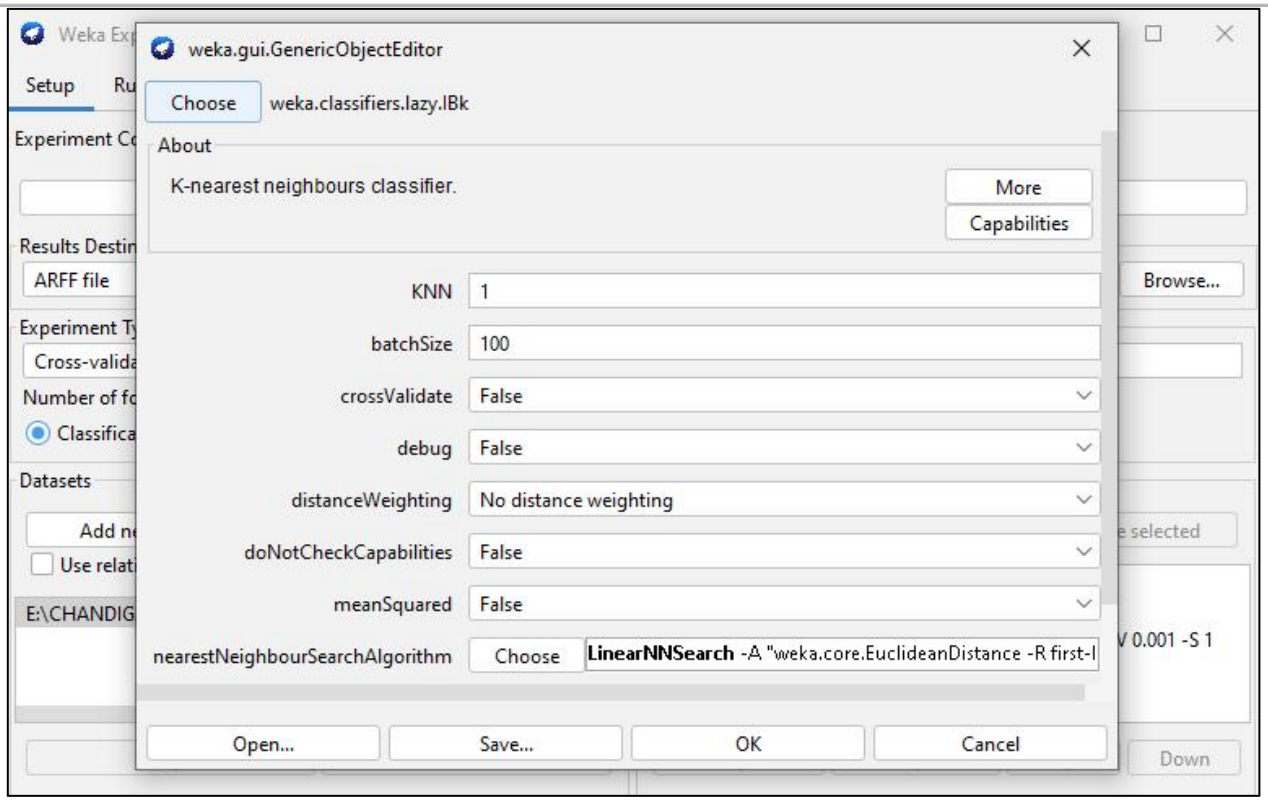
1) In the Algorithms section,click on choose add new> choose>>**ZeroR**.
2) In the Algorithms section,click on choose add new> choose>>**NaiveBayes**.
3) In the Algorithms section,click on choose add new> choose>>**RandomForest**.
4) In the Algorithms section,click on choose add new> choose>>**J48**.
5) In the Algorithms section,click on choose add new> choose>>**IBK(KNN classifier)**.

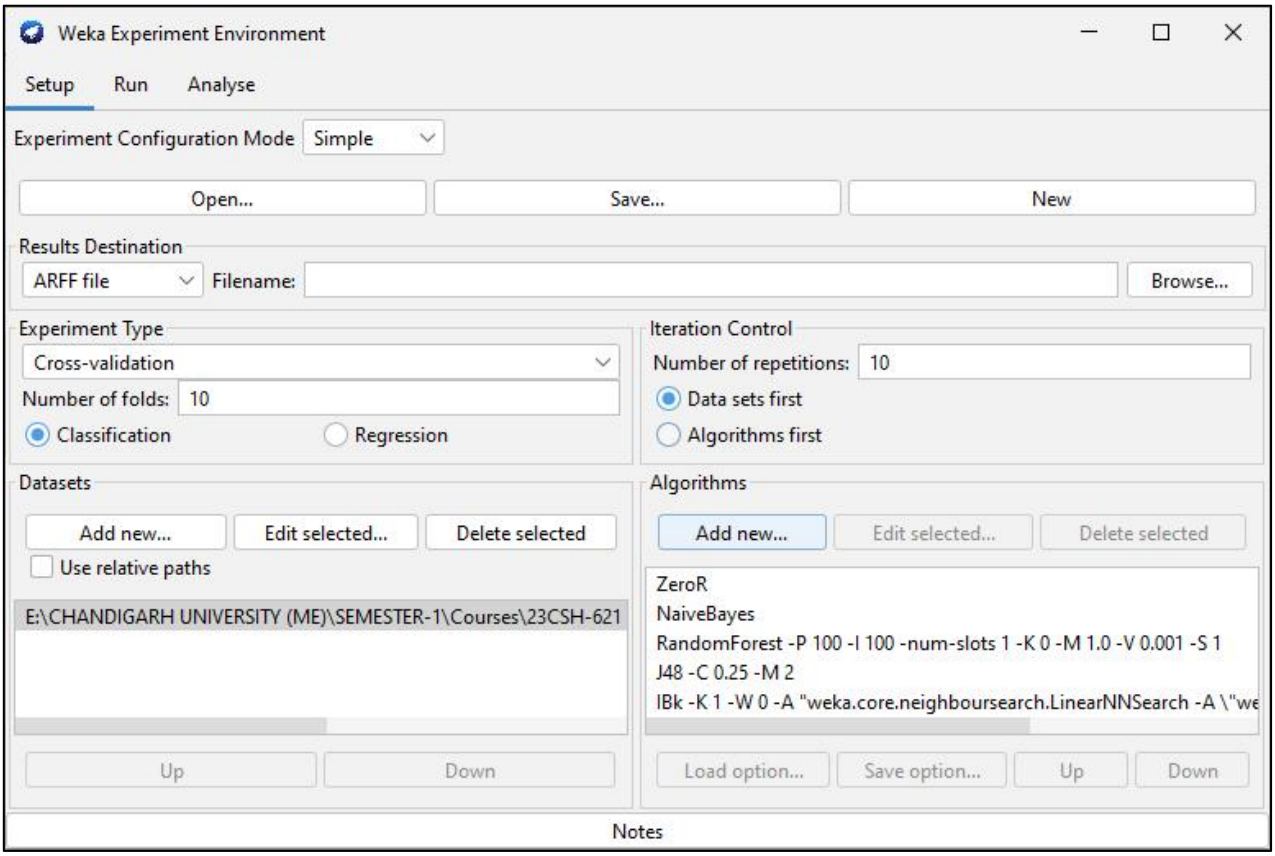

Weka Experiment Environment
Setup
Run
Analyse
Experiment Configuration Mode
Simple
weka.gui.GenericObjectEditor
Choose
weka.classifiers.rules.ZeroR
About
Class for building and using a 0-R classifier.
More
Capabilities
batchSize
100
debug
False
doNotCheckCapabilities
False
numDecimalPlaces
2
Open...
Save...
OK
Cancel
Results Destination
ARFF file
Browse...
Experiment Type
Cross-validation
Number of folds:
10
Classification
Datasets
Add new...
Use relative paths
Delete selected
Up
Down
Load option...
Save option...


Weka Experiment Environment
Setup
Run
weka.gui.GenericObjectEditor
Choose
weka.classifiers.bayes.NaiveBayes
About
Class for a Naive Bayes classifier using estimator classes.
More
Capabilities
batchSize
100
debug
False
displayModelInOldFormat
False
doNotCheckCapabilities
False
numDecimalPlaces
2
useKernelEstimator
False
useSupervisedDiscretization
False
Open...
Save...
OK
Cancel
Results Destination
ARFF file
Browse...
Experiment Type
Cross-validation
Number of folds:
Classification
Datasets
Add new...
Use relative paths
Delete selected
Up
Down
Load option...
Save option...

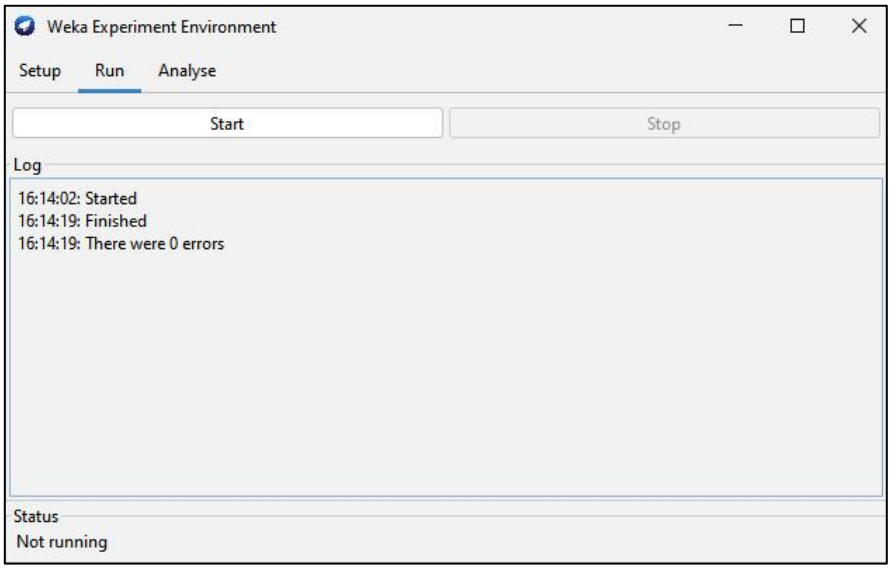

Weka Experiment Environment
Setup
Run
weka.gui.GenericObjectEditor
Choose
weka.classifiers.trees.RandomForest
About
Class for constructing a forest of random trees.
More
Capabilities
bagSizePercent
100
batchSize
100
breakTiesRandomly
False
calcOutOfBag
False
computeAttributeImportance
False
debug
False
doNotCheckCapabilities
False
Open...
Save...
OK
Cancel
Experiment Configura
Results Destination
ARFF file
Browse...
Experiment Type
Cross-validation
Number of folds:
Classification
Datasets
Add new...
Use relative path
E:\CHANDIGARH UN
Up
Down
Load option...
Save option...


Setup
Run
weka.gui.GenericObjectEditor
Choose
weka.classifiers.trees.J48
About
Class for generating a pruned or unpruned C4.
More
Capabilities
batchSize
100
binarySplits
False
collapseTree
True
confidenceFactor
0.25
debug
False
doNotCheckCapabilities
False
doNotMakeSplitPointActualValue
False
minNumObj
2
Open...
Save...
OK
Cancel
Results Destination
ARFF file
Browse...
Experiment Type
Cross-validation
Number of folds:
Classification
Datasets
Add new...
Use relative path
Up
Down
0.001 -S 1


weka.gui.GenericObjectEditor
Choose
weka.classifiers.lazy.IBk
About
K-nearest neighbours classifier.
More
Capabilities
KNN
1
batchSize
100
crossValidate
False
debug
False
distanceWeighting
No distance weighting
doNotCheckCapabilities
False
meanSquared
False
nearestNeighbourSearchAlgorithm
Choose
LinearNNSearch -A "weka.core.EuclideanDistance -R first-l
Open...
Save...
OK
Cancel

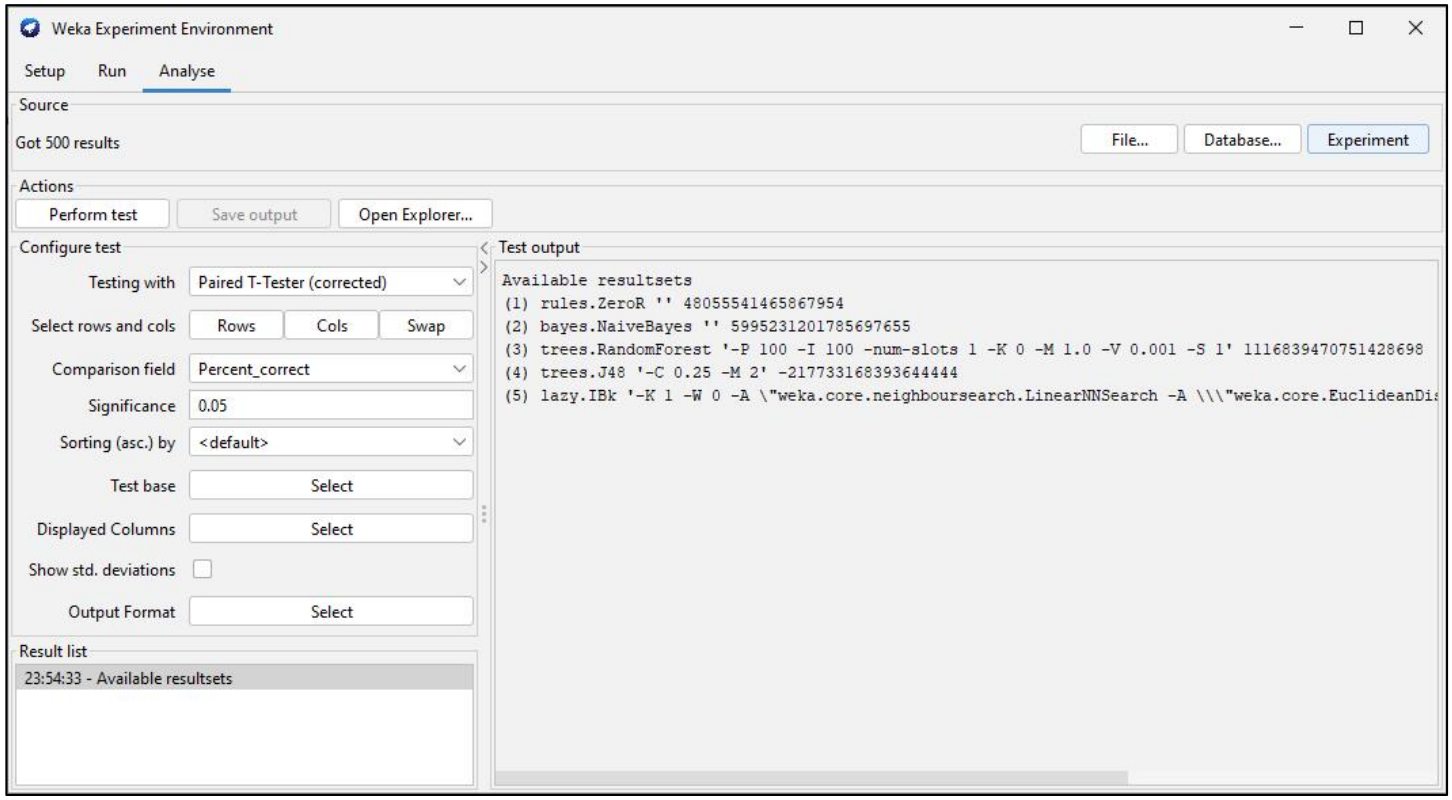

Weka Experiment Environment
Setup
Run
Analyse
Experiment Configuration Mode
Simple
Open...
Save...
New
Results Destination
ARFF file
Filename:
Browse...
Experiment Type
Cross-validation
Number of folds:
10
Classification
Regression
Iteration Control
Number of repetitions:
10
Data sets first
Algorithms first
Datasets
Add new...
Edit selected...
Delete selected
Use relative paths
E:\CHANDIGARH UNIVERSITY (ME)\SEMESTER-1\Courses\23CSH-621
Algorithms
Add new...
Edit selected...
Delete selected
ZeroR
NaiveBayes
RandomForest -P 100 -I 100 -num-slots 1 -K 0 -M 1.0 -V 0.001 -S 1
J48 -C 0.25 -M 2
IBk -K 1 -W 0 -A "weka.core.neighboursearch.LinearNNSearch -A \"we
Up
Down
Load option...
Save option...
Up
Down
Notes

6) Click on **'Run'** tab >> click **'Start'**.

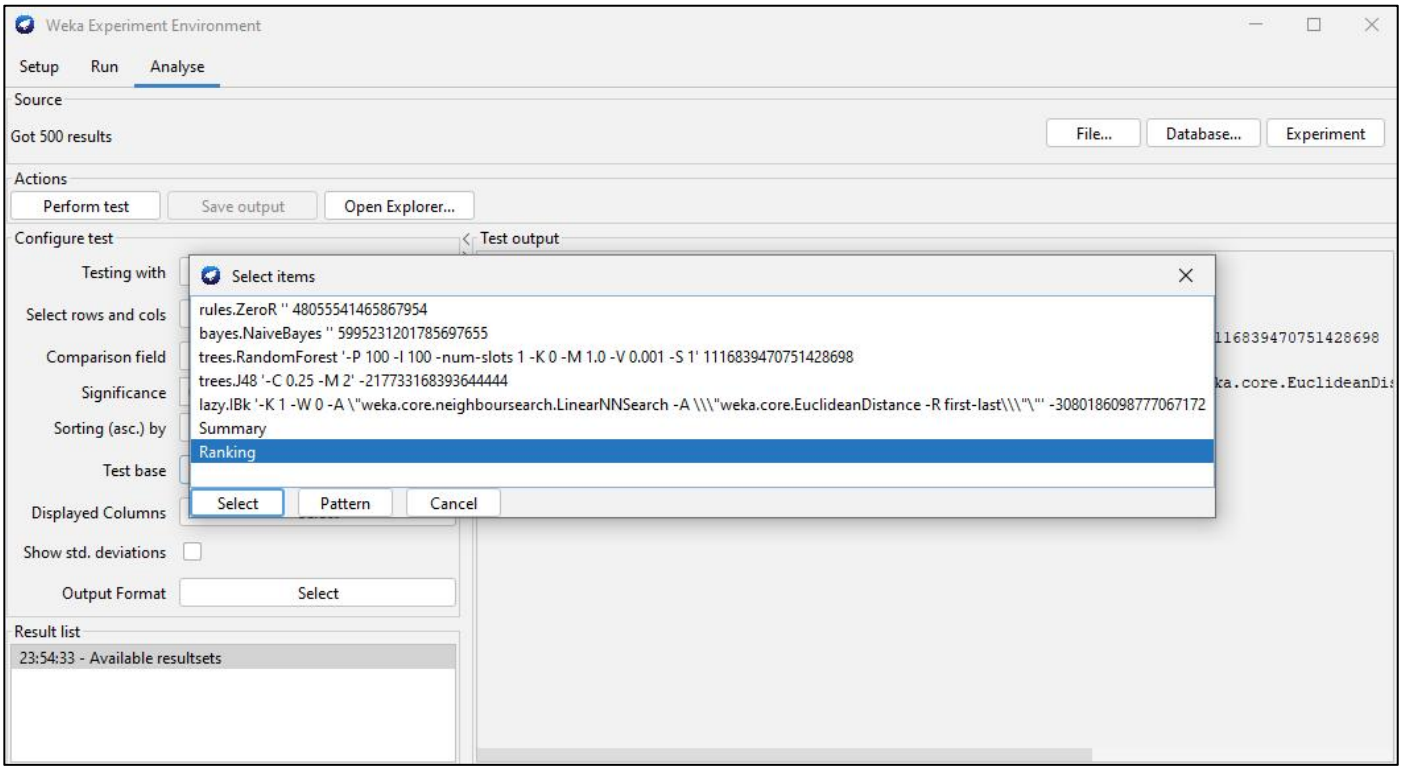


7) After the execution is completed in 'Run' tab >>click on **'Analyse'** tab.

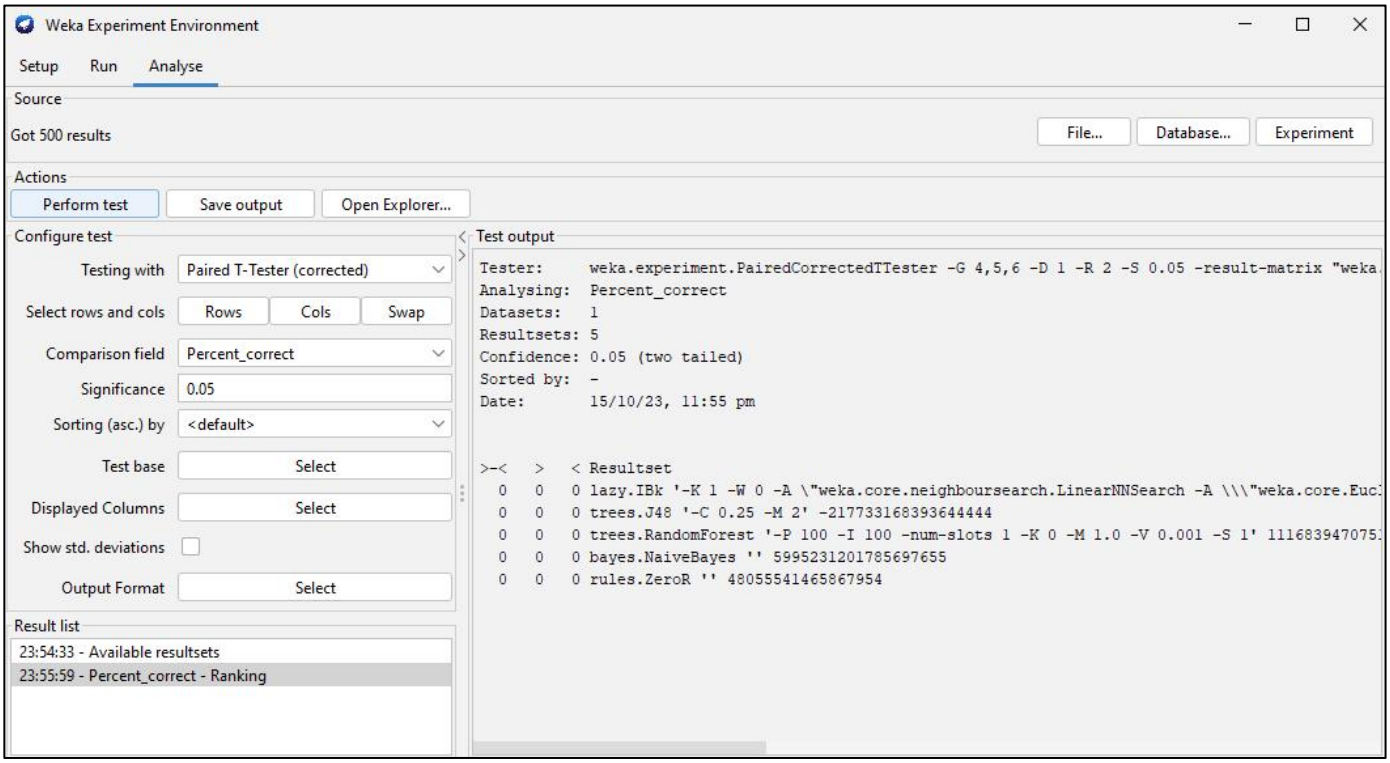
8) In the **'Analyse'** tab >> click on **'Experiment'** tab >> all the options will become active.



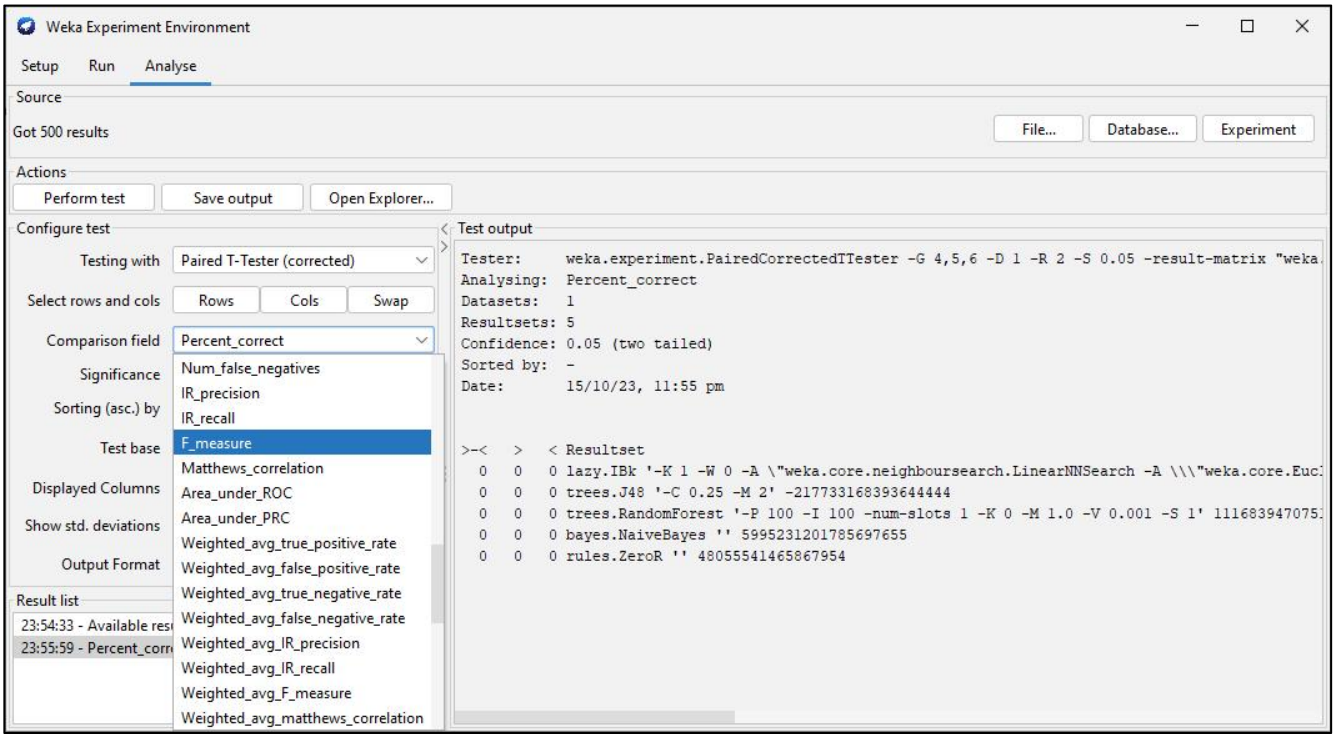
9) In **Configure test** section >> click on **Test base**>> and select **Ranking**>>click on **Perform test.**



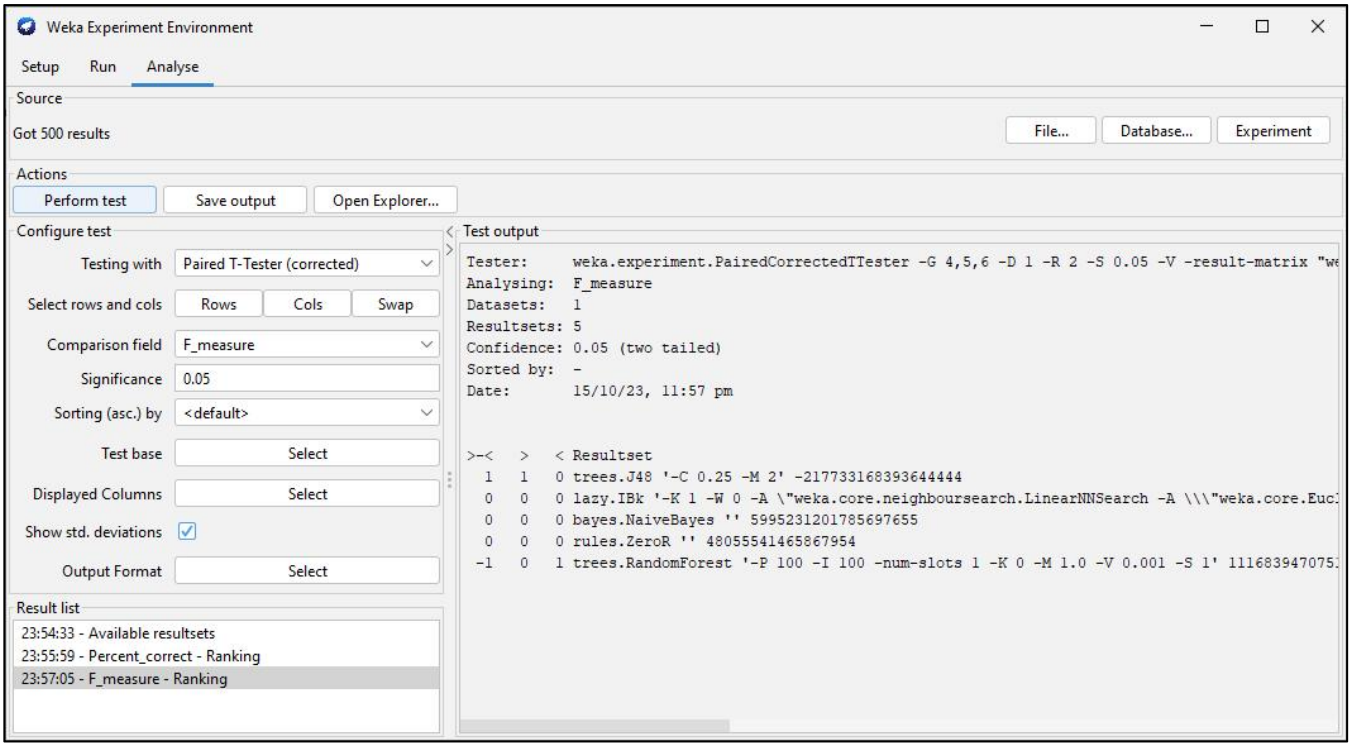
10) In **Test area** ,it will show algorithms which have performed better and will display the ranking.

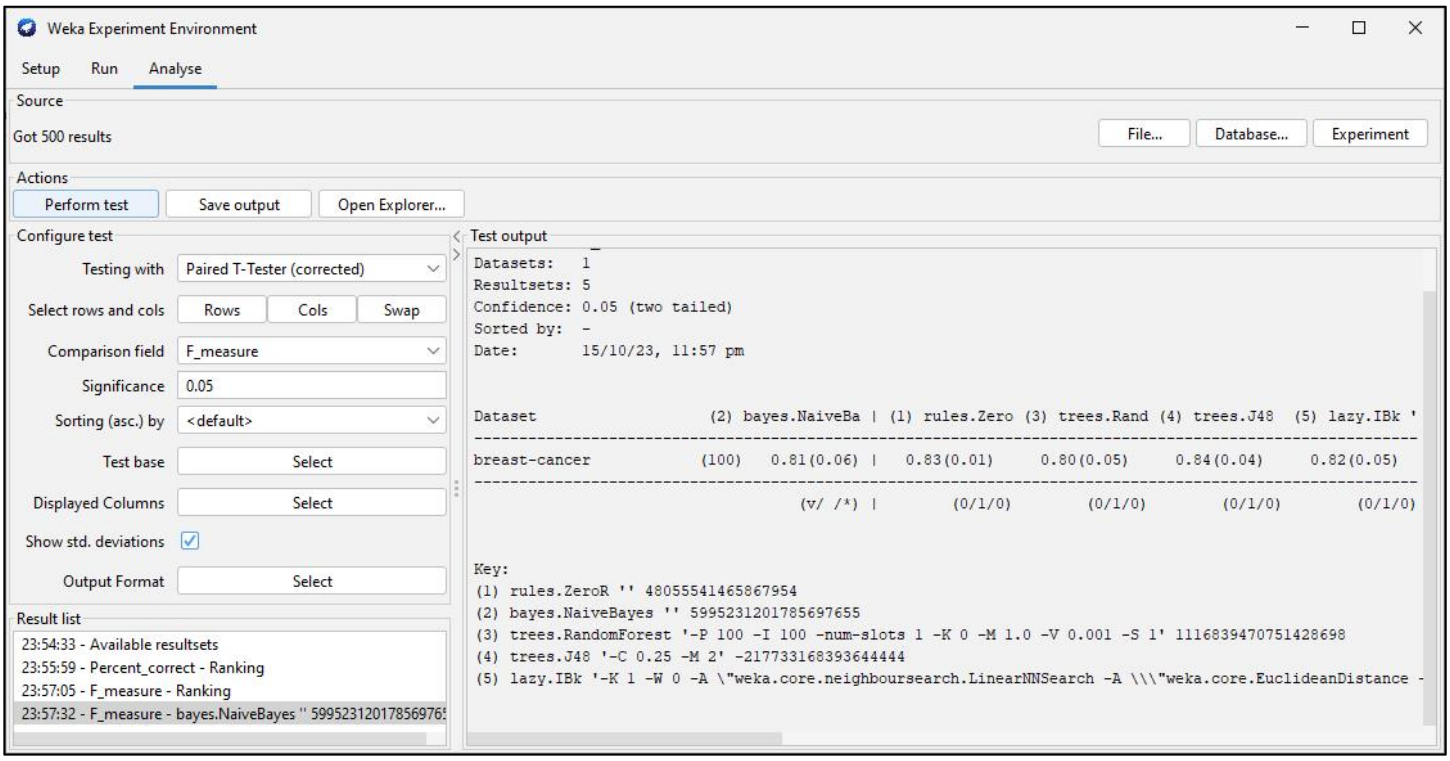


11) To check the **f-measure** and std_dev of an particular algorithm >>click on std_tab >>then select the algorithm which you want to test >> select **f-measure** from the **comparison_field** tab.



12) Click on **Perform test**.





Learning outcomes (What I have learnt):

1. I learnt about the WEKA Tool and its applications.
2. I learnt about how to use the Experimenter Tab in WEKA..
3. I learnt about different machine learning classifiers in WEKA Tool.
4. I learnt about Ranking, F-Measure and Standard Deviation in WEKA.
5. I learnt about how to find the best prediction model in WEKA.