23481A0514

Experiment 3:

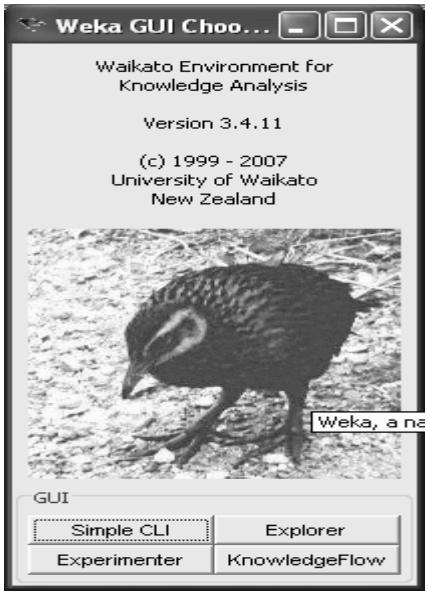
Aim: Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets

- Explore various options available in Weka for preprocessing data and apply Unsupervised filters like Discretization, Resample filter, etc. on each dataset
- Load weather. nominal, Iris, Glass datasets into Weka and run Apriori Algorithm with different support and confidence values.
- Study the rules generated. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated.
- Derive interesting insights and observe the effect of discretization in the rule generation process.

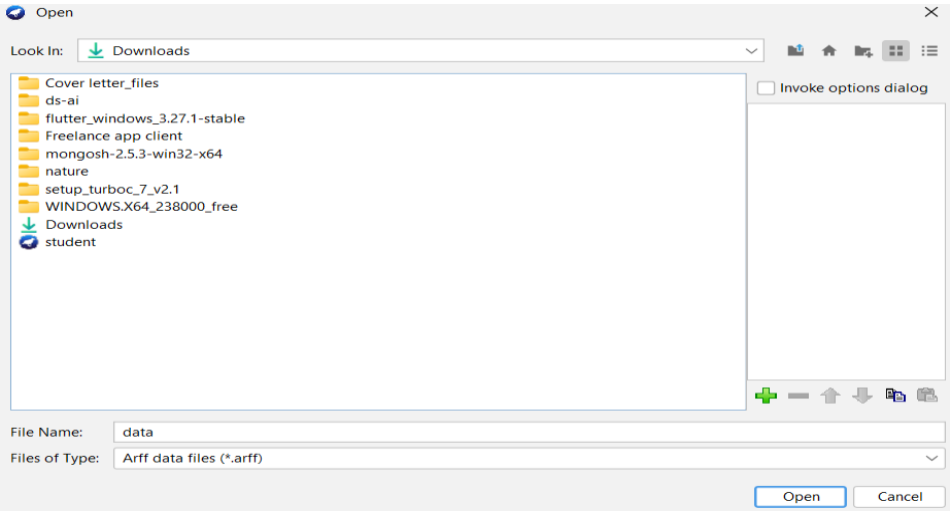
i.Add attribute ii. Add expression iii. Copy attribute iv. Remove attribute

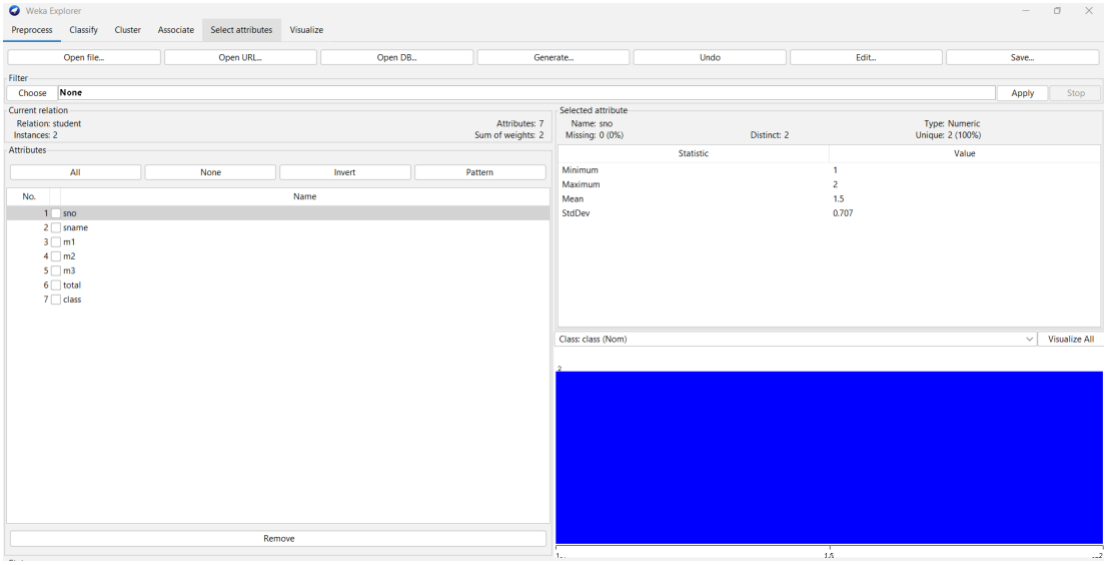
Filters

Step-1: - Go to start button then select All Programs and then select weka 3.4.1.1



Click on Explorer

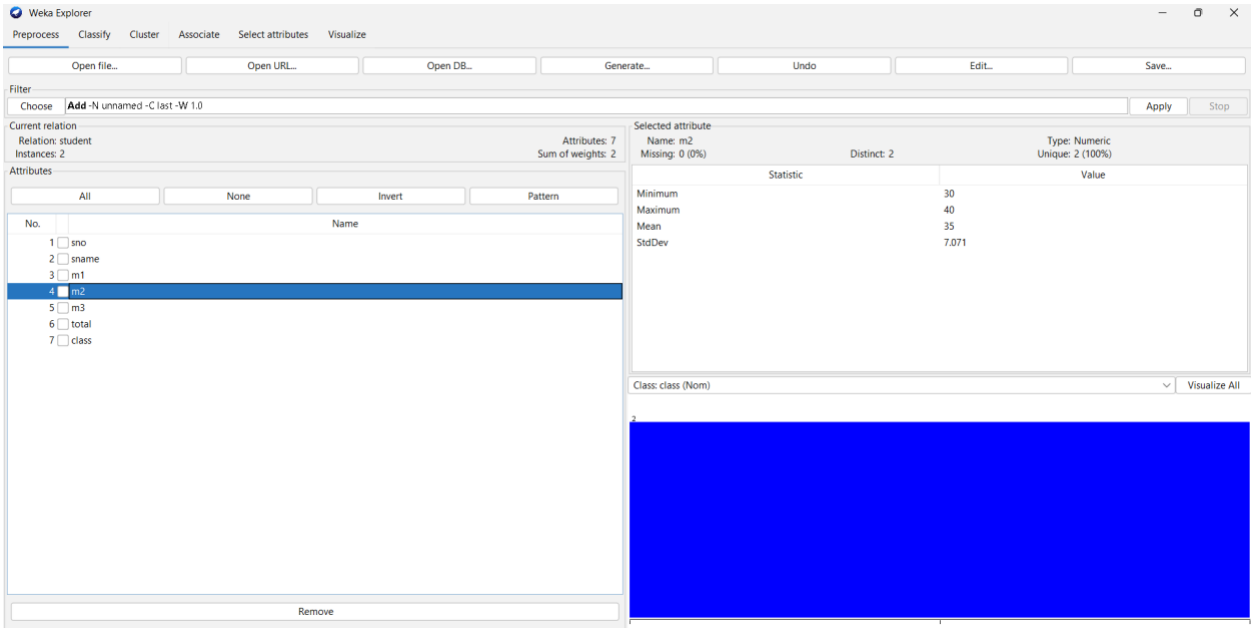


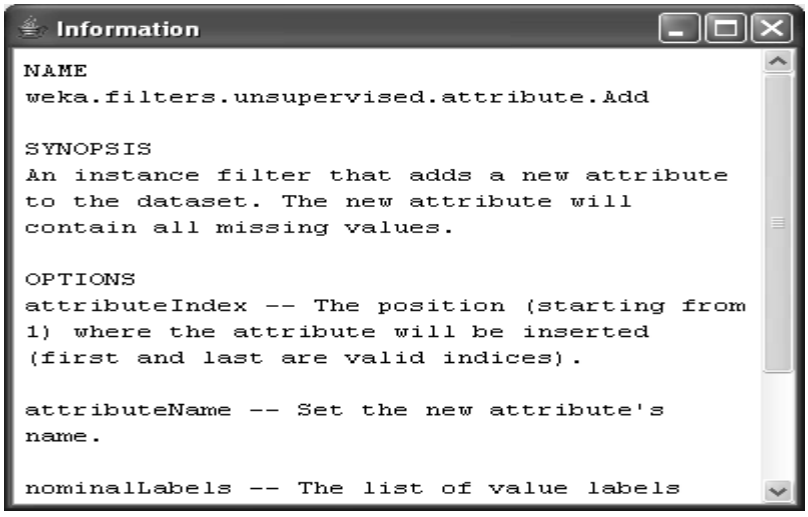


To open the required file

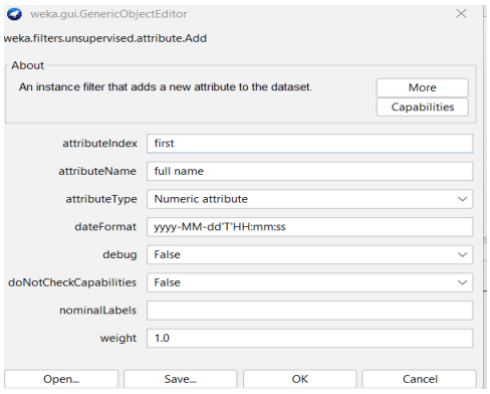
ADD ATTRIBUTE

Step-2: - Go to preprocess menu and choose then select attribute of Add option.

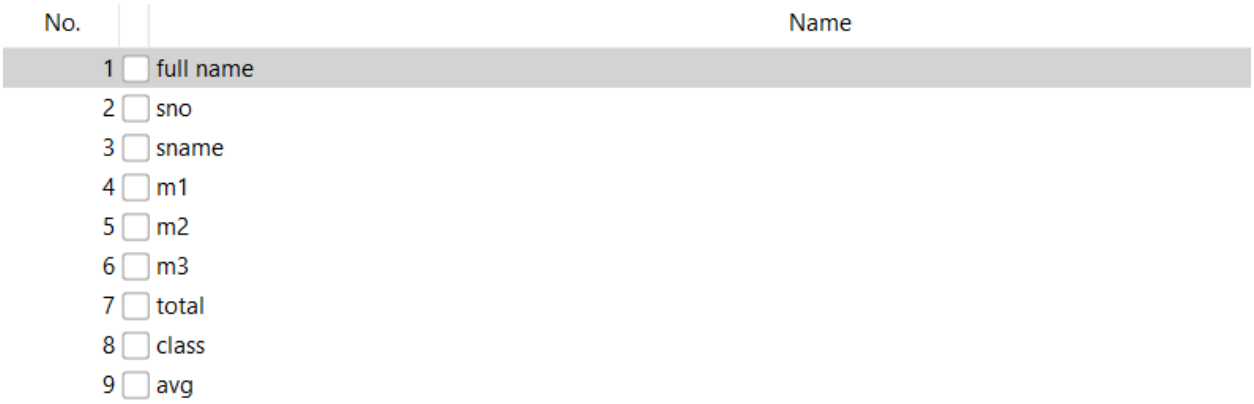




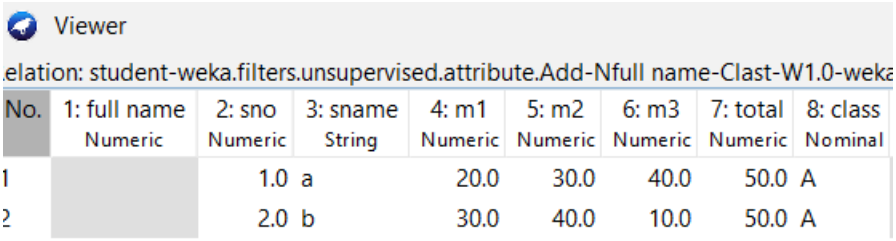
Step-3: -To enter the required fields is added to table.



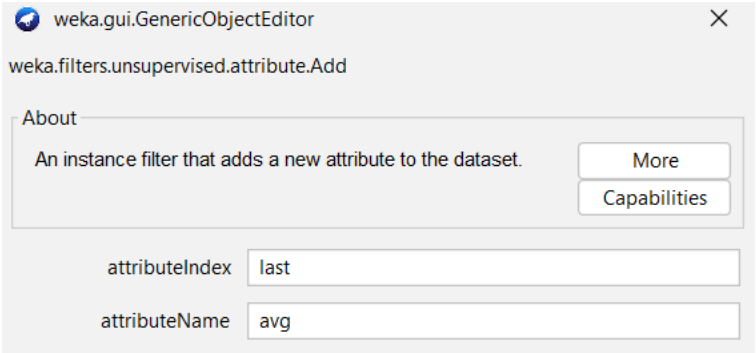
Click on ok button



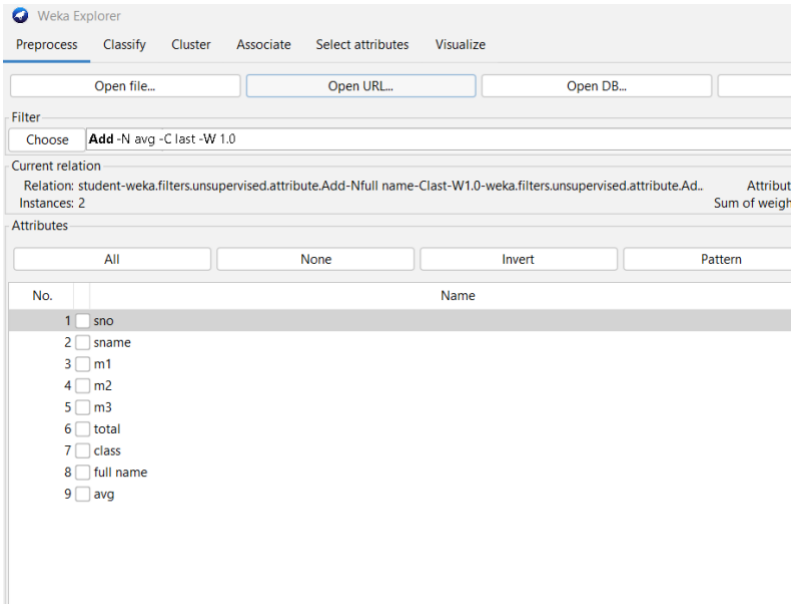
Click on Apply button.



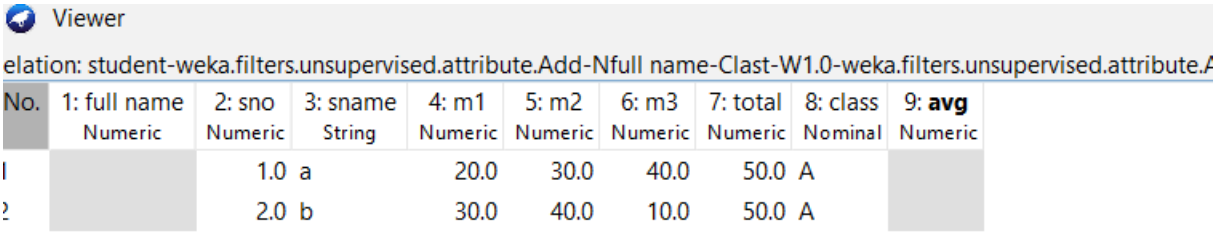
Step-4: - if the index position is last to enter the fields



Click on Ok button.

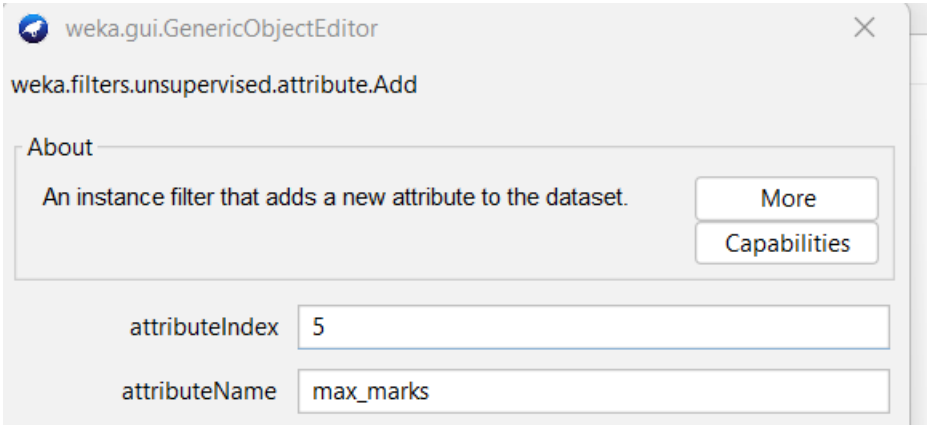


Click on Apply button.

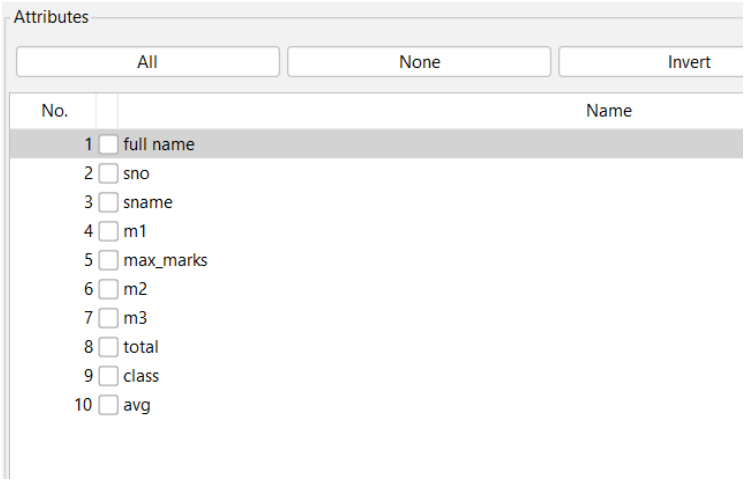


Click on ok button.

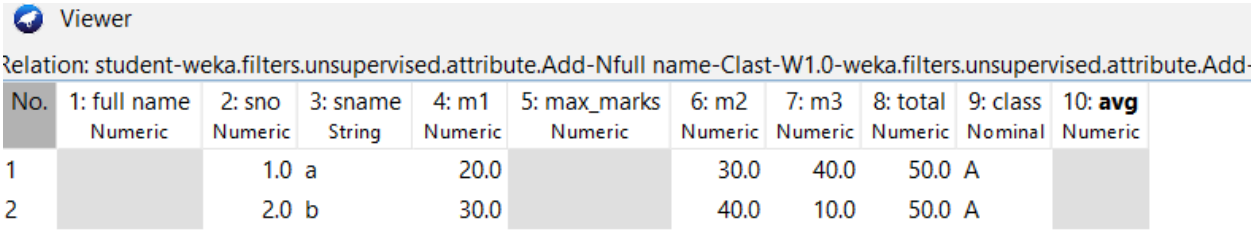
Step-5: -if the index position is middle



Click on ok button.



Click on Apply button.

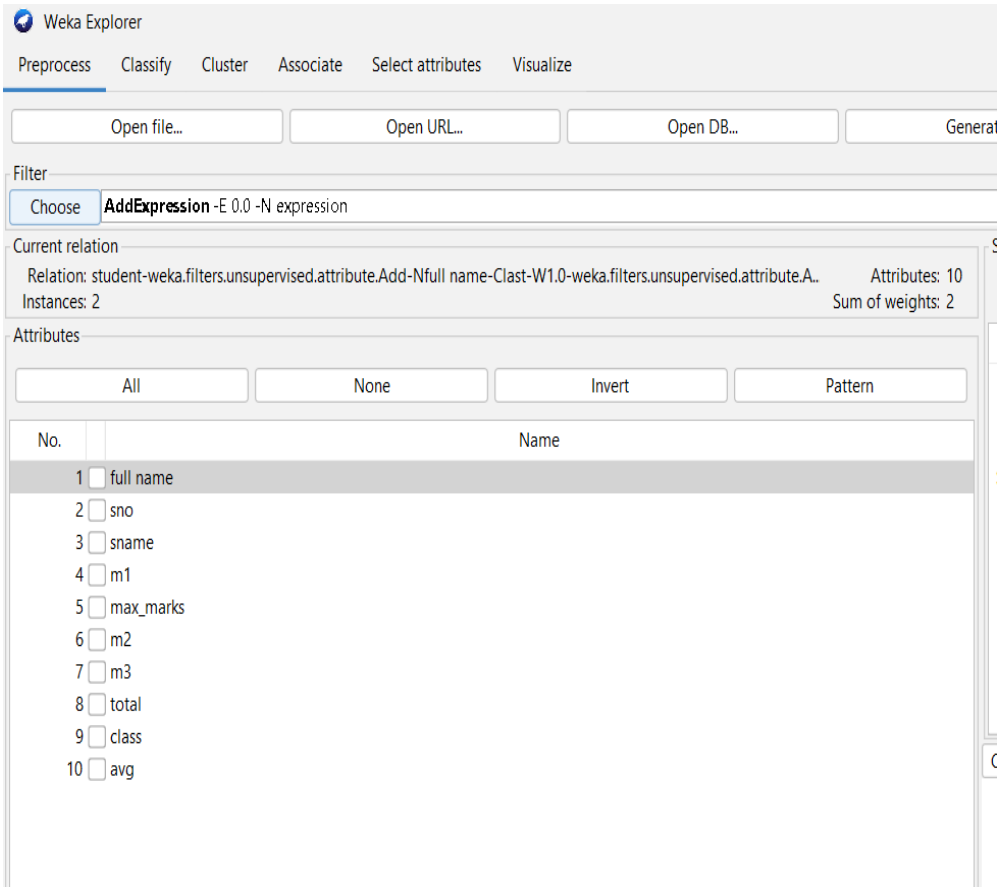


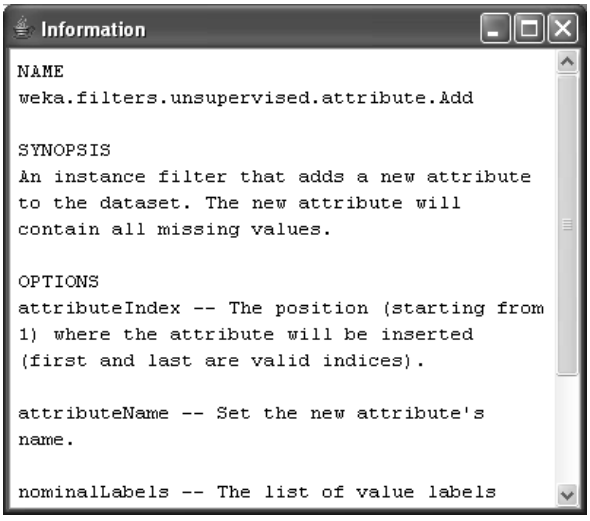
No.	1: full name Numeric	2: sno Numeric	3: sname String	4: m1 Numeric	5: max_marks Numeric	6: m2 Numeric	7: m3 Numeric	8: total Numeric	9: class Nominal	10: **avg** Numeric
1		1.0	a	20.0		30.0	40.0	50.0	A	
2		2.0	b	30.0		40.0	10.0	50.0	A	

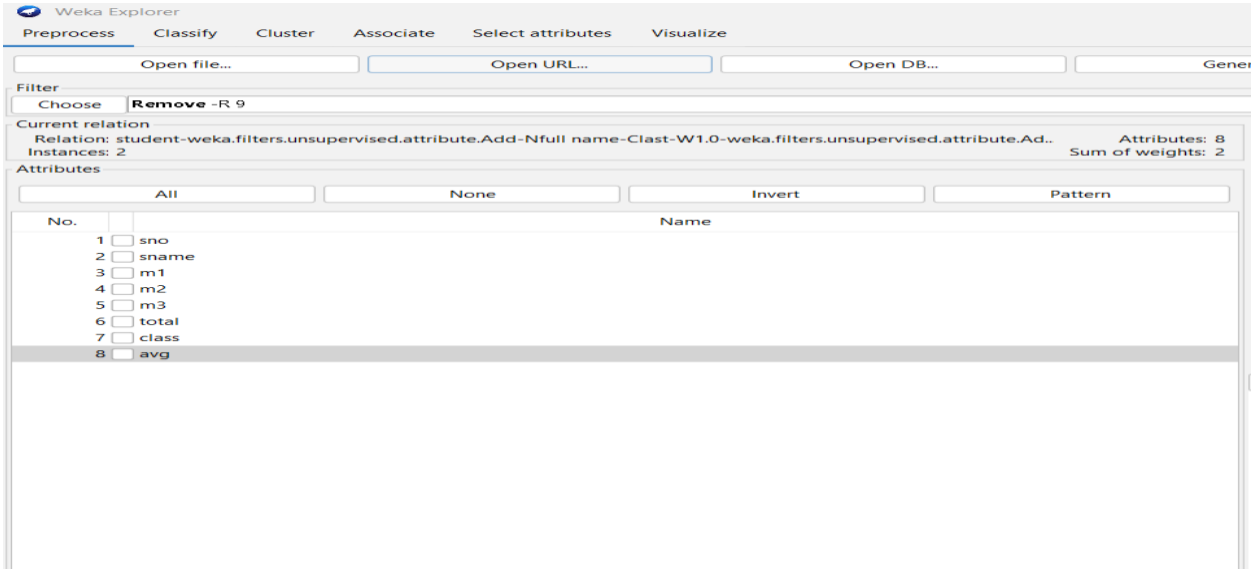
Click on ok button.

Add Expression

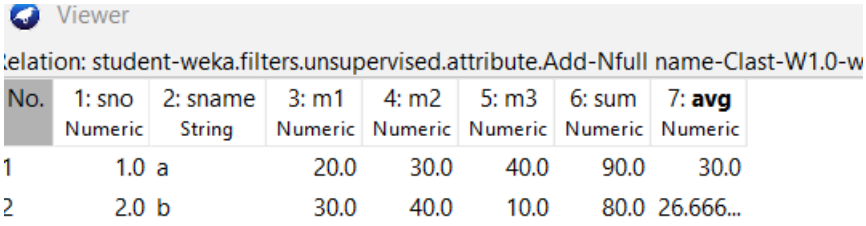
Step-6: - click on choose button and then select AddExpression option.

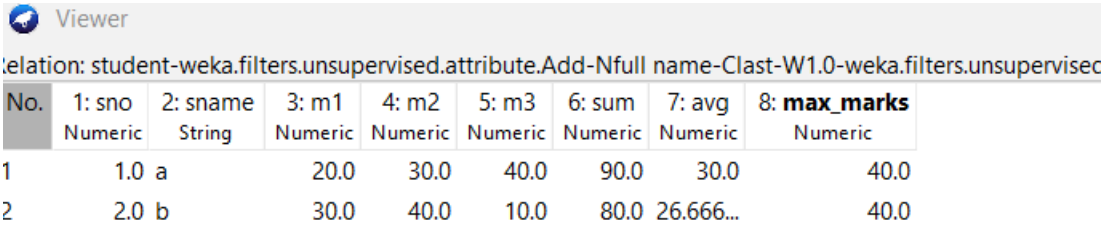

Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Open file...
Open URL...
Open DB...
Filter
Choose
AddExpression -E 0.0 -N expression
Current relation
Relation: student-weka.filters.unsupervised.attribute.Add-Nfull name-Clast-W1.0-weka.filters.unsupervised.attribute.A..
Attributes: 10
Instances: 2
Sum of weights: 2
Attributes
All
None
Invert
Pattern
No.
Name
1 full name
2 sno
3 sname
4 m1
5 max_marks
6 m2
7 m3
8 total
9 class
10 avg


Information
NAME
weka.filters.unsupervised.attribute.Add
SYNOPSIS
An instance filter that adds a new attribute
to the dataset. The new attribute will
contain all missing values.
OPTIONS
attributeIndex -- The position (starting from
1) where the attribute will be inserted
(first and last are valid indices).
attributeName -- Set the new attribute's
name.
nominalLabels -- The list of value labels

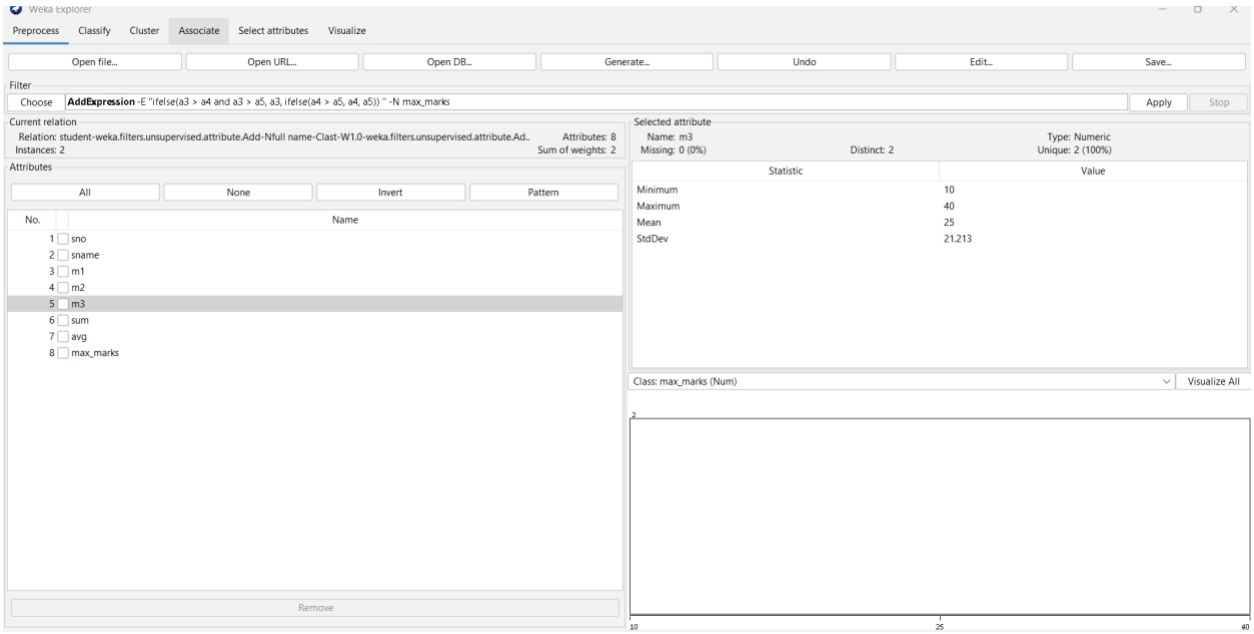


Click on Apply option.



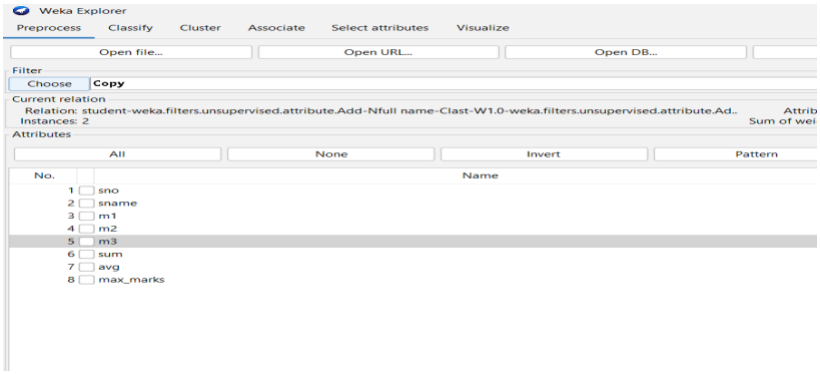


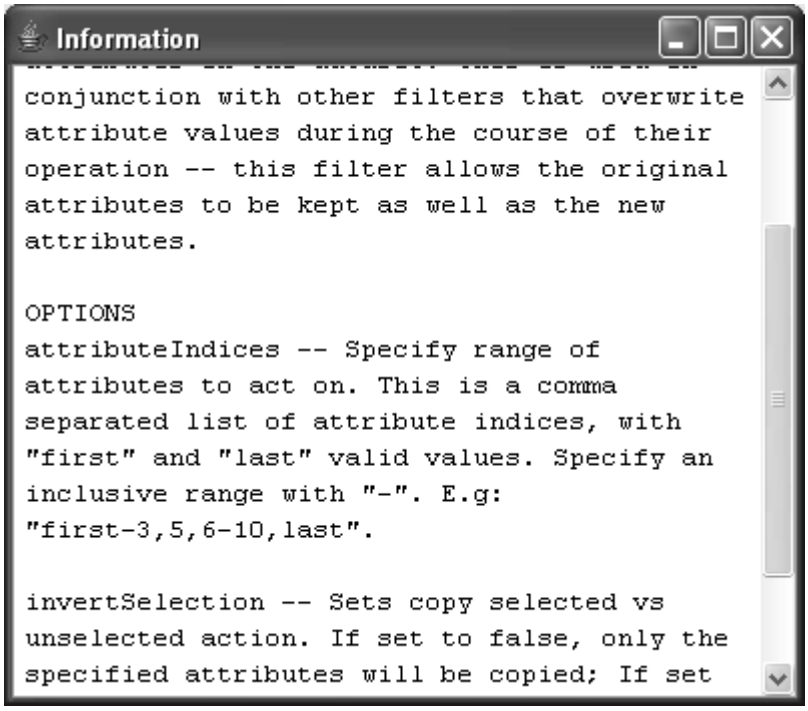
Click on ok button.



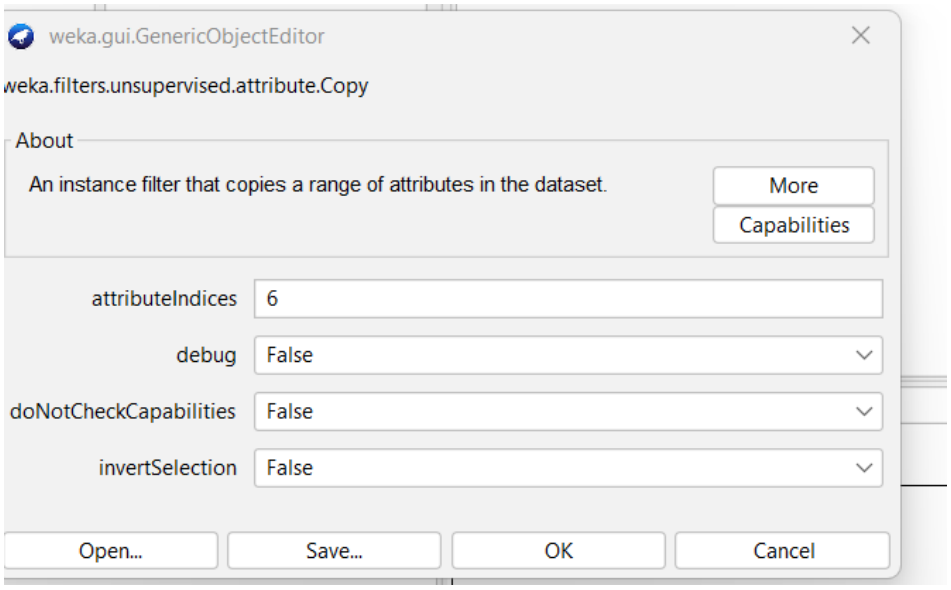
COPY

Step-7: - Click on choose button and then select copy option.

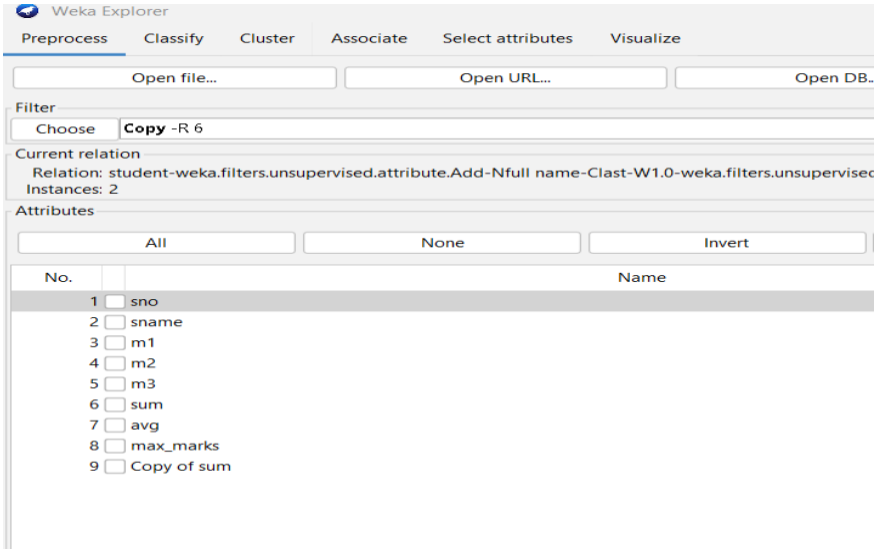




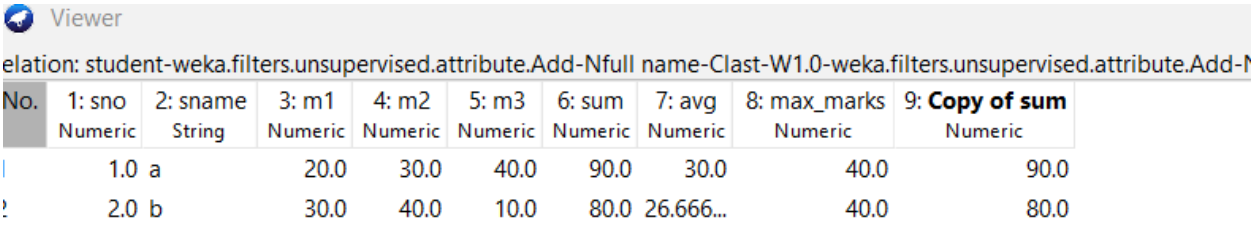
If the index place is any



Click on ok button.



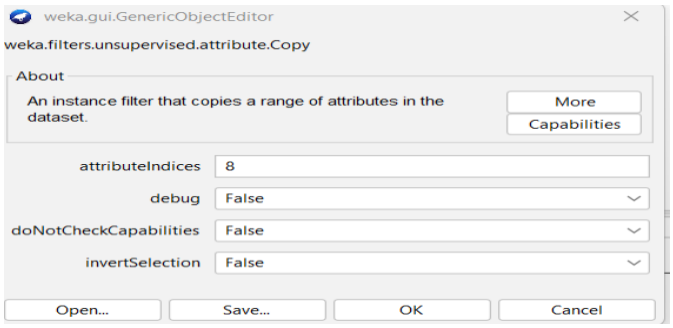
Click On ok button.



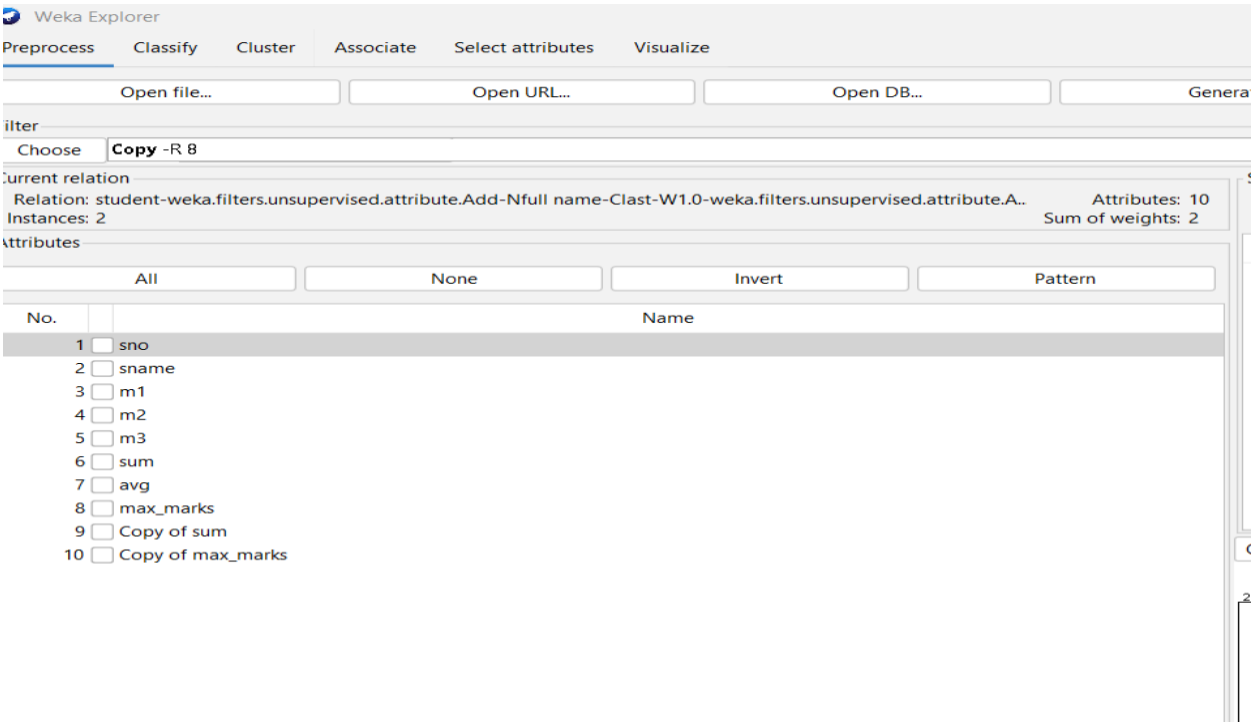
No.	1: sno Numeric	2: sname String	3: m1 Numeric	4: m2 Numeric	5: m3 Numeric	6: sum Numeric	7: avg Numeric	8: max_marks Numeric	9: **Copy of sum** Numeric
	1.0	a	20.0	30.0	40.0	90.0	30.0	40.0	90.0
	2.0	b	30.0	40.0	10.0	80.0	26.666...	40.0	80.0

Click on ok button.

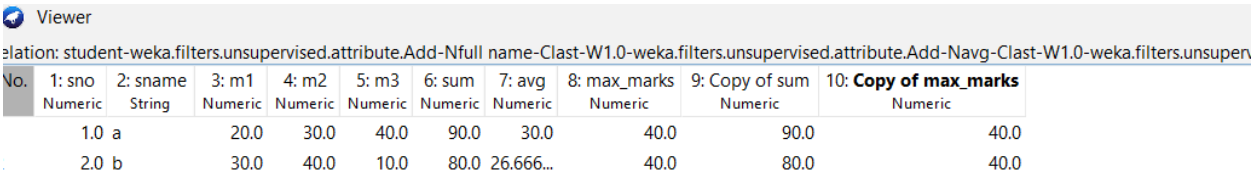
If the last position.



Click on ok button.

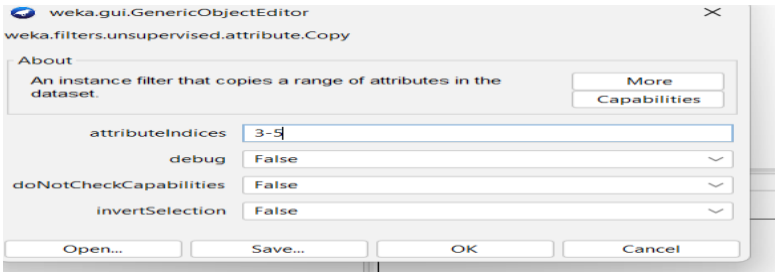


Click on Apply option.



Click on ok button.

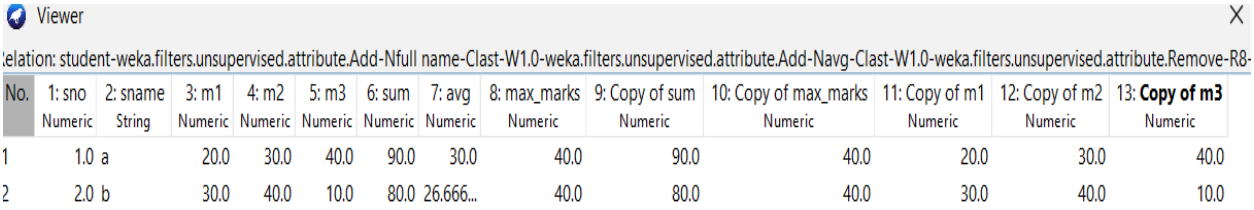
If the index position range.



Click on ok button.

No.	Name
1	sno
2	sname
3	m1
4	m2
5	m3
6	sum
7	avg
8	max_marks
9	Copy of sum
10	Copy of max_marks
11	Copy of m1
12	Copy of m2
13	Copy of m3

Click on Apply option.



Viewer

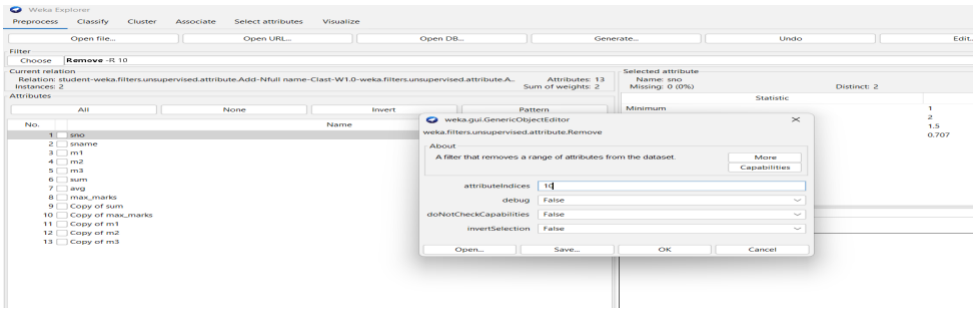
Relation: student-weka.filters.unsupervised.attribute.Add-Nfull name-Clast-W1.0-weka.filters.unsupervised.attribute.Add-Navg-Clast-W1.0-weka.filters.unsupervised.attribute.Remove-R8-

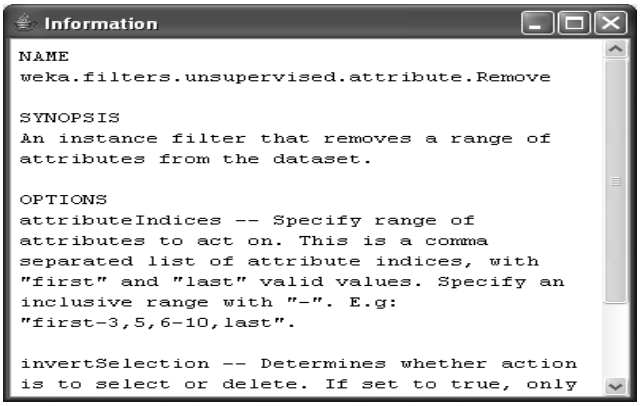
No.	1: sno Numeric	2: sname String	3: m1 Numeric	4: m2 Numeric	5: m3 Numeric	6: sum Numeric	7: avg Numeric	8: max_marks Numeric	9: Copy of sum Numeric	10: Copy of max_marks Numeric	11: Copy of m1 Numeric	12: Copy of m2 Numeric	13: **Copy of m3** Numeric
1	1.0	a	20.0	30.0	40.0	90.0	30.0	40.0	90.0	40.0	20.0	30.0	40.0
2	2.0	b	30.0	40.0	10.0	80.0	26.666...	40.0	80.0	40.0	30.0	40.0	10.0

Click on ok button.

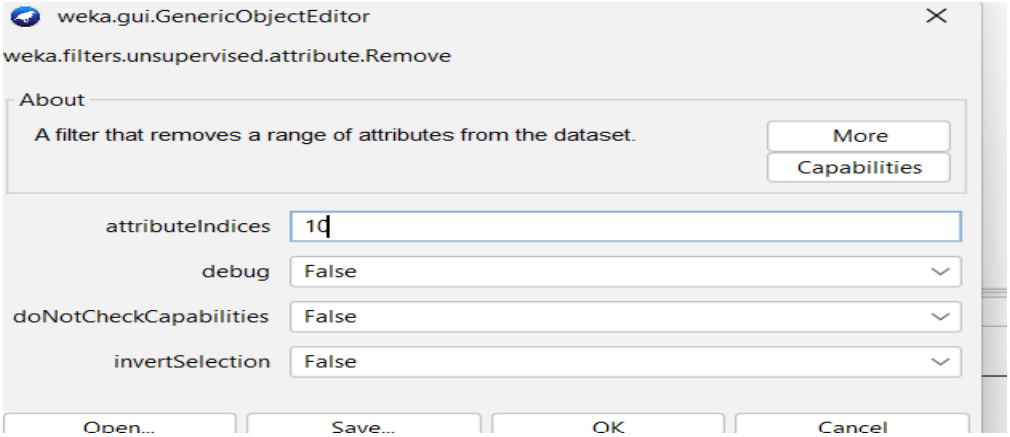
REMOVE

Step-8:- Click on choose button and then select Remove option

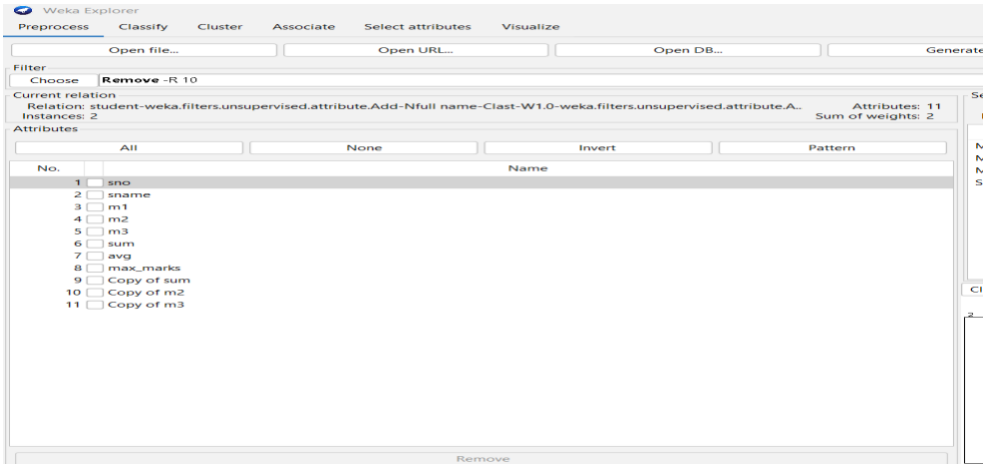




If the index position is first.

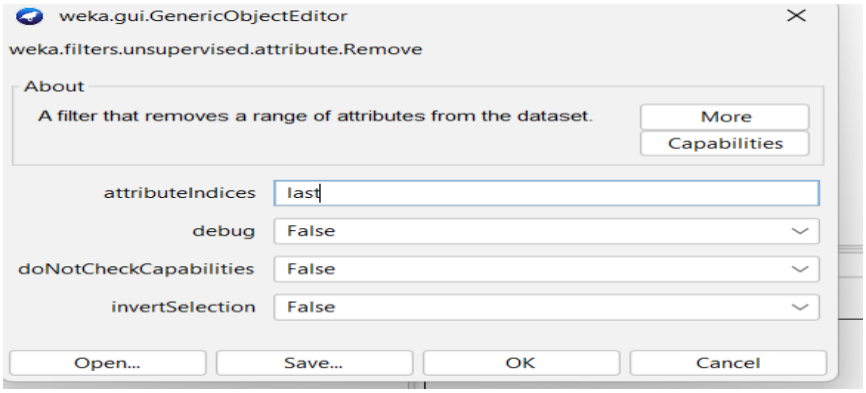


Click on ok button.

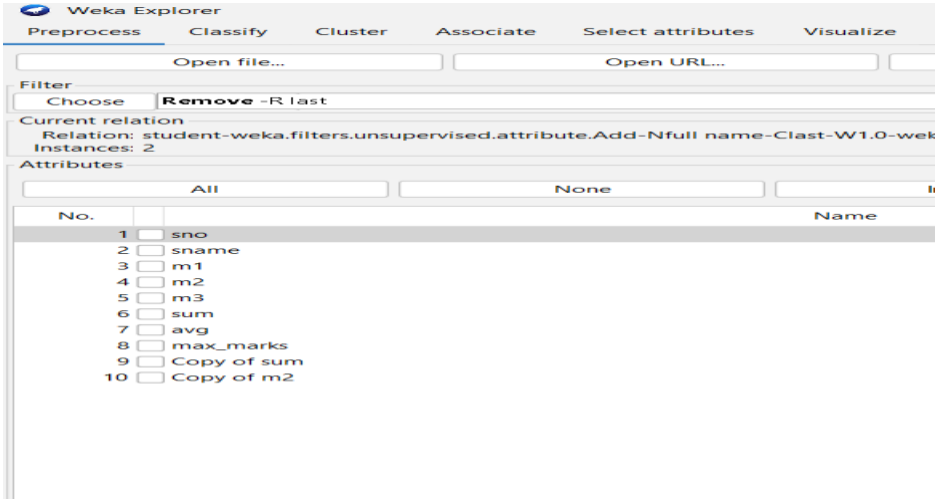


Click on Apply option.

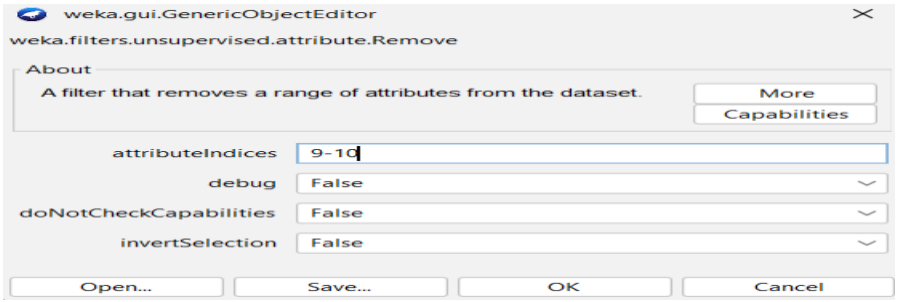
If the index position is last.



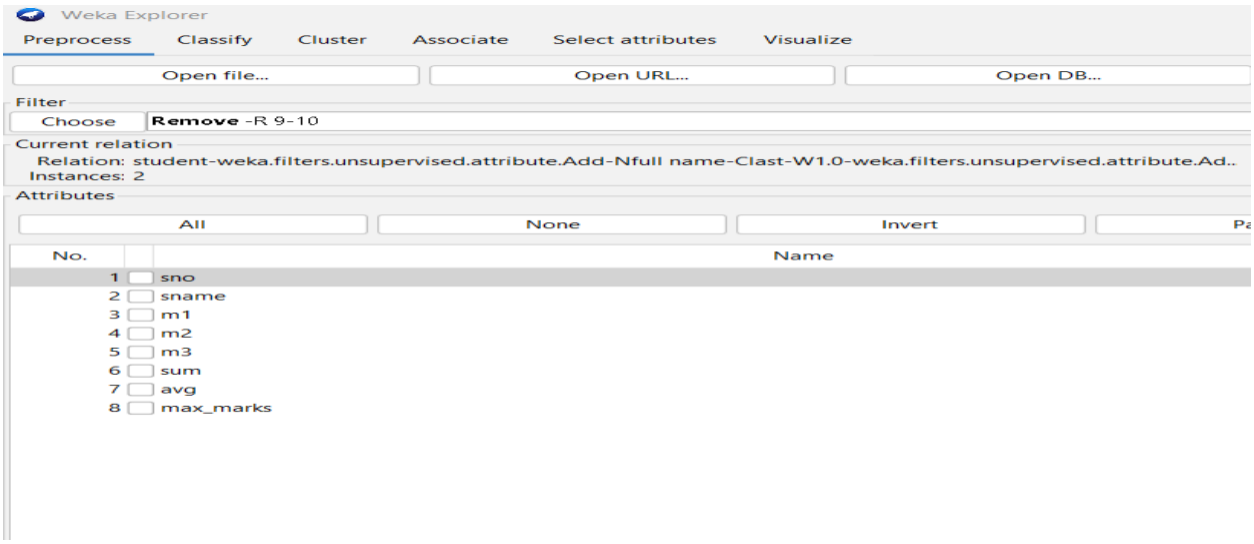
Click on ok button.



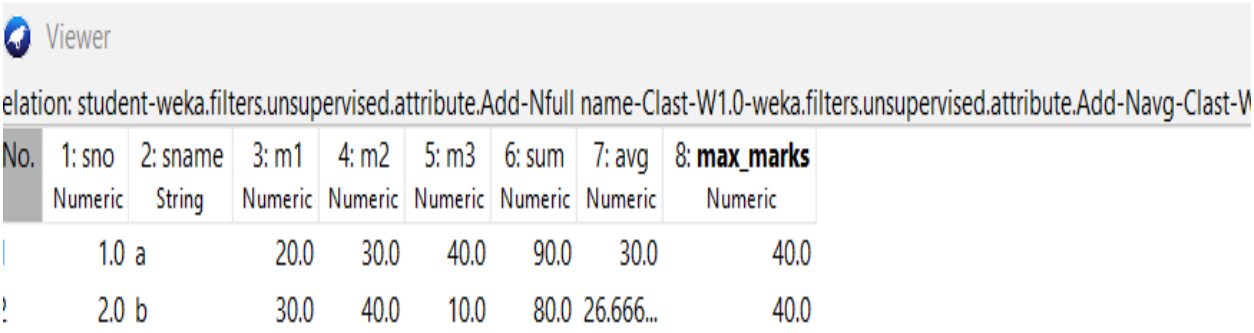
If the range .



Click on ok button.



Click on Apply option.



No.	1: sno Numeric	2: sname String	3: m1 Numeric	4: m2 Numeric	5: m3 Numeric	6: sum Numeric	7: avg Numeric	8: max_marks Numeric
1	1.0	a	20.0	30.0	40.0	90.0	30.0	40.0
2	2.0	b	30.0	40.0	10.0	80.0	26.666...	40.0

Click on ok button.

FILE FORMATES FOR WEKA

1. Create CSV(Comma Separated Values) file.

Step1: Create an excel file and save with specified format as CSV(Comma Delimited).

Step2: Now open with notepad and check the values.Here,the fields of data in each row are delimited with a comma and individual rows are separated by new line.

2. Create arff(Attribute Relation File Format) file.

Step1: Open a notepad and type the data as instructed below:

ARFF files have two distinct sections. The first section is the **Header** information, which is followed the **Data** information.

The **Header** of the ARFF file contains the name of the relation, a list of the attributes (the columns in the data), and their types. An example header on the standard IRIS dataset looks like this:

```
% 1. Title: Iris Plants Database
%
% 2. Sources:
%      (a) Creator: Balu
%      (b) Donor: Shiva
%      (c) Date: Feb 2023
%
@RELATION iris

@ATTRIBUTE       sepallength             NUMERIC
@ATTRIBUTE sepalwidth   NUMERIC
@ATTRIBUTE petallength  NUMERIC
@ATTRIBUTE petalwidth   NUMERIC
@ATTRIBUTE class       {Iris-setosa,Iris-versicolor,Iris-virginica}
```

The **Data** of the ARFF file looks like the following:

```
@DATA
5.1,3.5,1.4,0.2,Iris-setosa
4.9,3.0,1.4,0.2,Iris-setosa
4.7,3.2,1.3,0.2,Iris-setosa
4.6,3.1,1.5,0.2,Iris-setosa
5.0,3.6,1.4,0.2,Iris-setosa
```

5.4,3.9,1.7,0.4,Iris-setosa
4.6,3.4,1.4,0.3,Iris-setosa
5.0,3.4,1.5,0.2,Iris-setosa
4.4,2.9,1.4,0.2,Iris-setosa
4.9,3.1,1.5,0.1,Iris-setosa

Lines that begin with a % are comments. The **@RELATION**, **@ATTRIBUTE** and **@DATA** declarations are case insensitive.

Step 2: Save the file as .arff.

Step 3: Open with Weka Explorer and check the file values.

3. Convert CSV to ARFF file format.

Step1: Open CSV file with notepad

Step 2: To fill header and data section in CSV file.

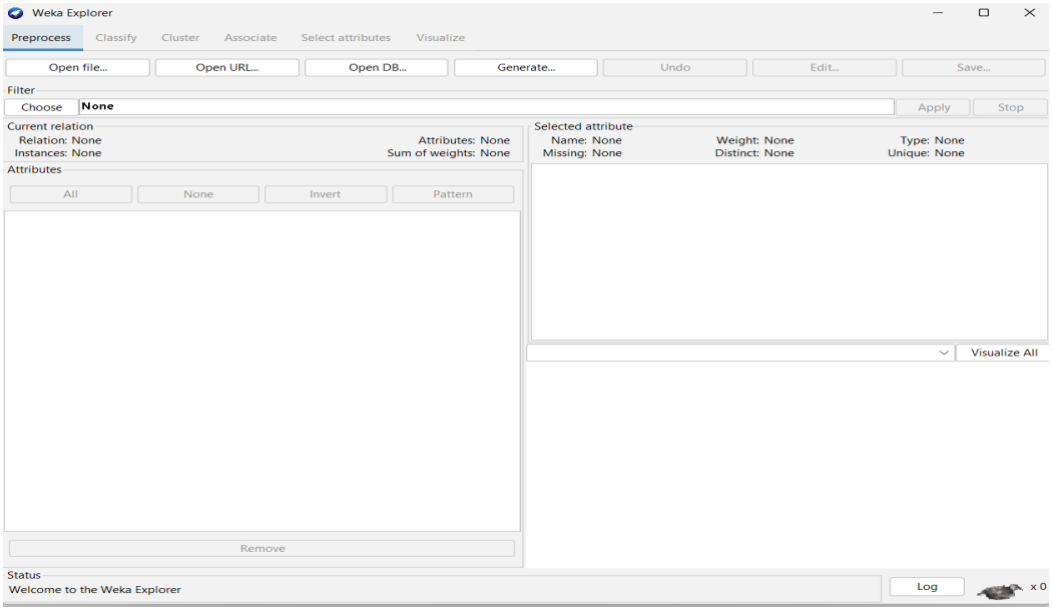
Step 3: save the file type as arff.

Strep 4: Open with Weka Explorer.

Load CSV Files in the Weka Explorer

1.Start the weka chooser

2. Launch the Weka Explorer by clicking the “Explorer” button.



3.Click the “Open File…..”button

4. Navigate to your current working directory. Change the “Files of Type” to “CSV data files (*.csv)”. Select your file and click the “Open” button.

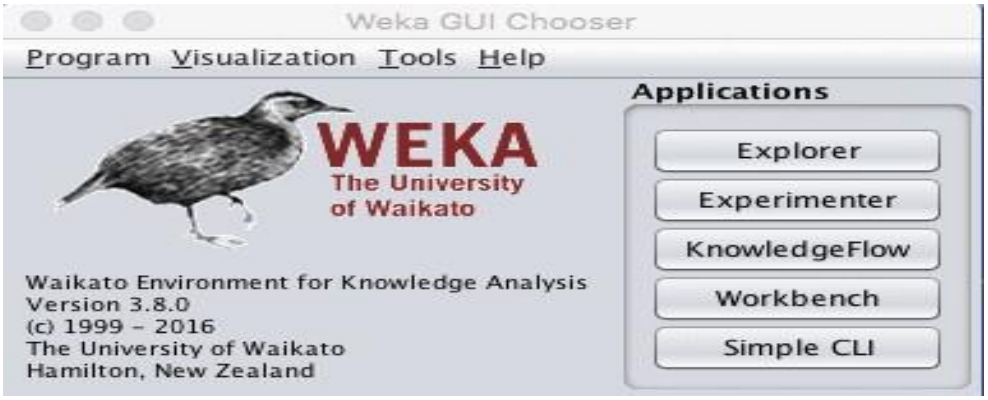
Data PreProcessing

Data Cleaning

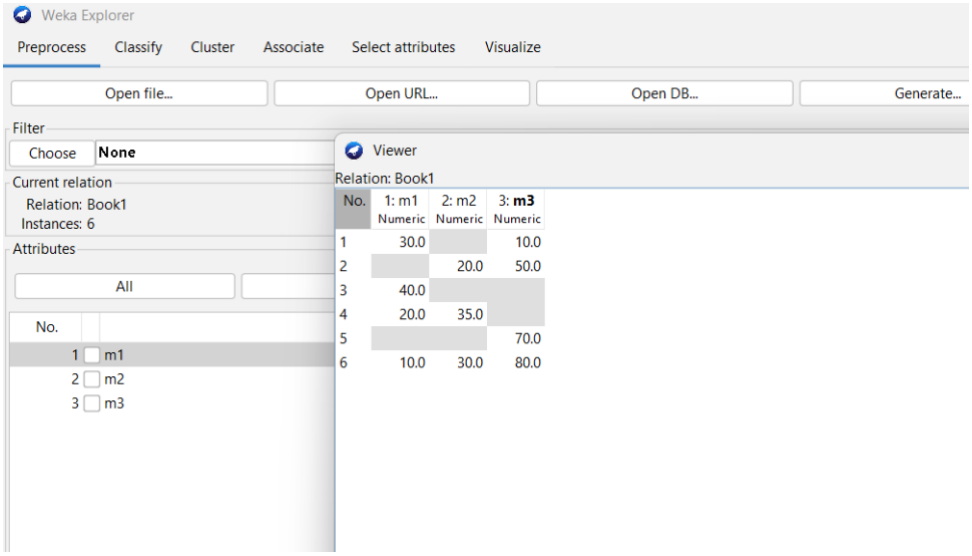
1.Missing-values

1.Remove with

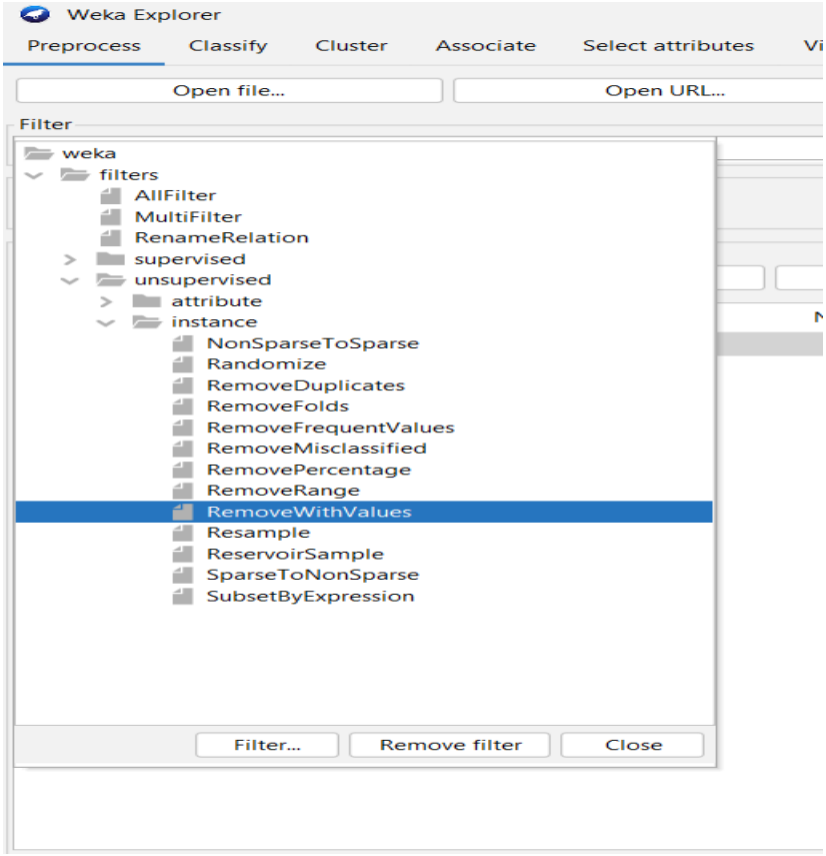
Value 1. Start Weka and choose Explorer



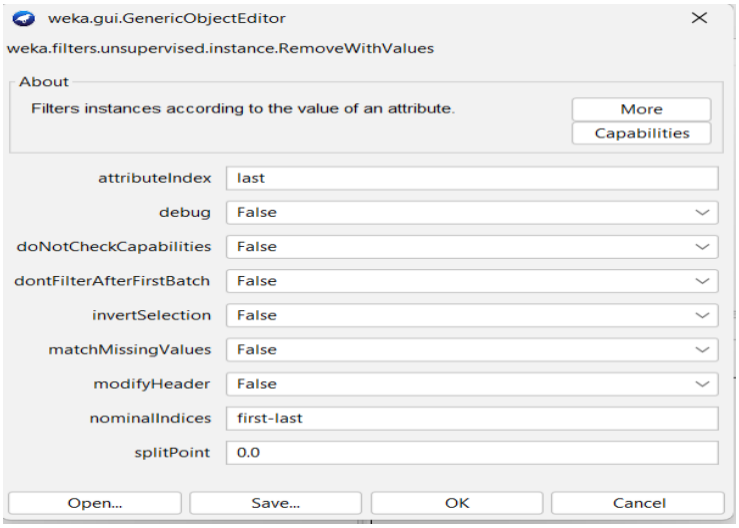
2. Load missing.csv data set.



3. Click “Choose” in tab Preproces -> Filter-> unsupervised->instance->RemovewithValues which you will find in.

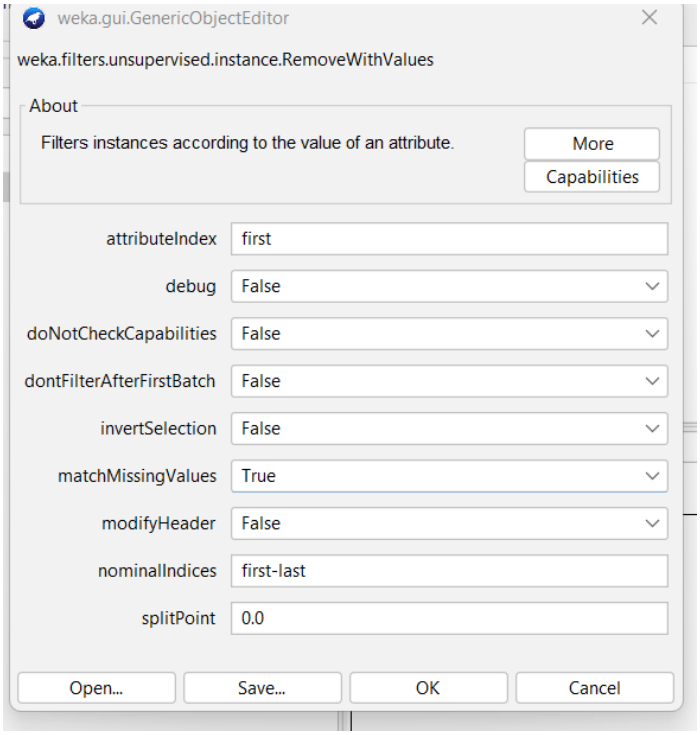


4.click on filter tag to configure:



5.Set attributeIndex to first

6.Set matchMissingValues to True



7.Press "OK", in order to use filter configuration.

8.Press "Apply", in order to use selected filter.

Before applying result

Viewer

Relation: Book1

No.	1: m1 Numeric	2: m2 Numeric	3: **m3** Numeric
1	30.0		10.0
2		20.0	50.0
3	40.0		
4	20.0	35.0	
5			70.0
6	10.0	30.0	80.0

After Applying result

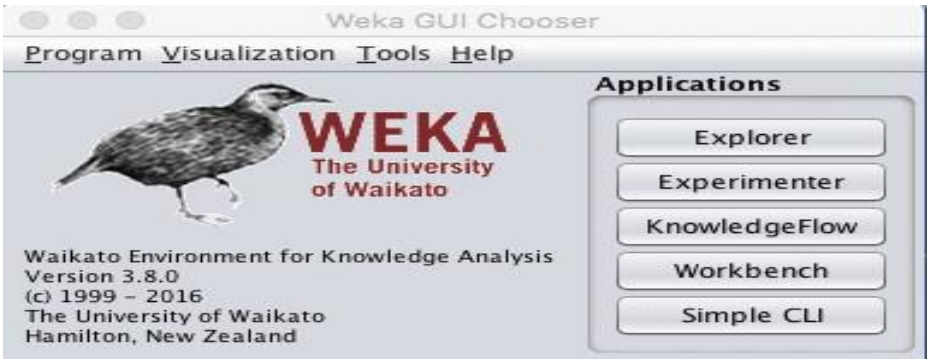
Viewer

Relation: Book1-weka.filters.unsupervised.instance.Re

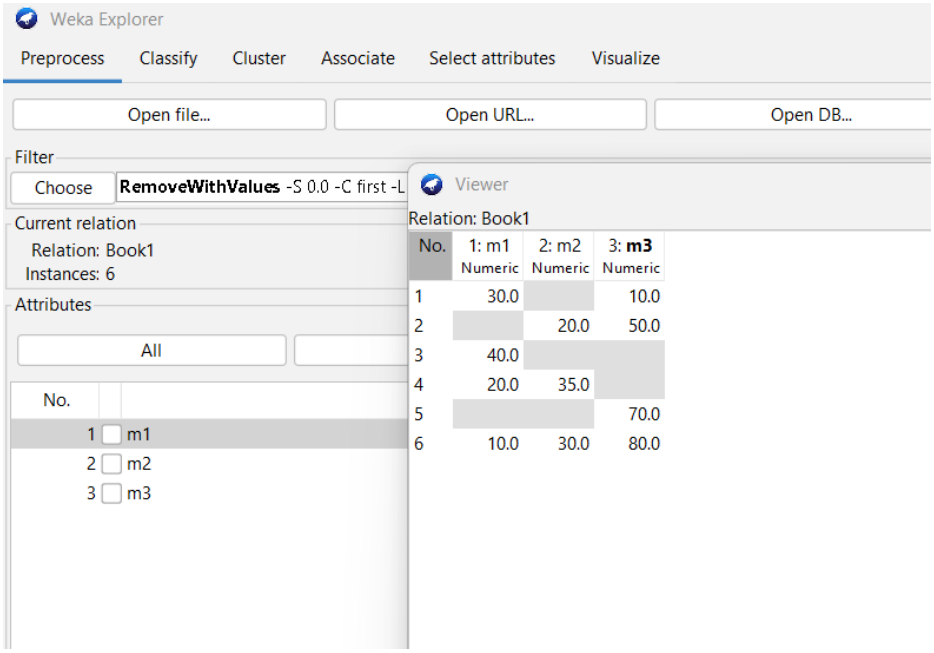
No.	1: m1 Numeric	2: m2 Numeric	3: **m3** Numeric
1	30.0		10.0
2	40.0		
3	20.0	35.0	
4	10.0	30.0	80.0

2.Replacing Missing with userConstant

1. Start Weka and choose Explorer

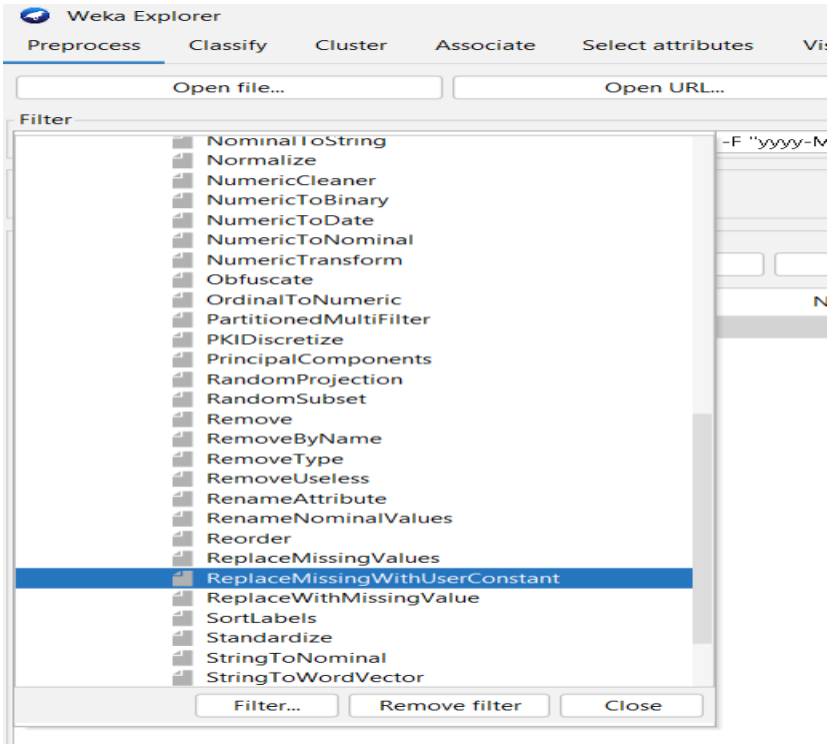


2. Load missing.csv data set.

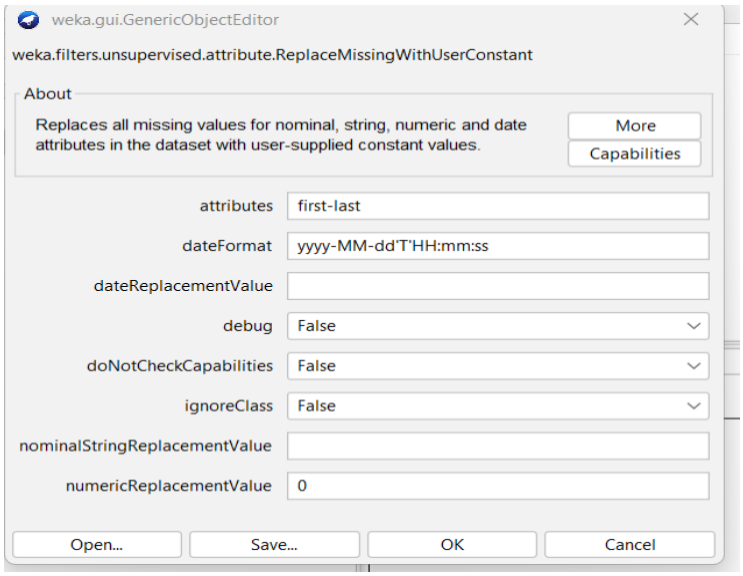


3. Click "Choose" in tab Preproces -> Filter-> unsupervised->attribute-

>ReplaceMissingWithUserConstant which you will find in.



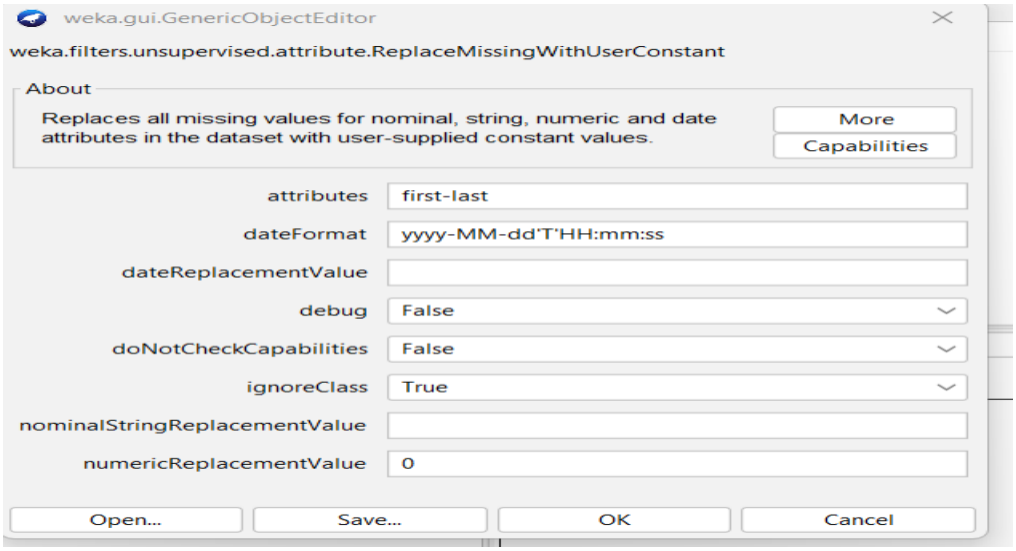
4. Click on filter tab to configure it



5. Set attributeIndex to first

6. Set igonreClass to True

7. set numericReplacementValue to 0



8. Press "OK", in order to use filter configuration.

9. Press "Apply", in order to use selected filter.

Before applying result

Viewer

Relation: Book1

No.	1: m1 Numeric	2: m2 Numeric	3: **m3** Numeric
1	30.0		10.0
2		20.0	50.0
3	40.0		
4	20.0	35.0	
5			70.0
6	10.0	30.0	80.0

After Applying result

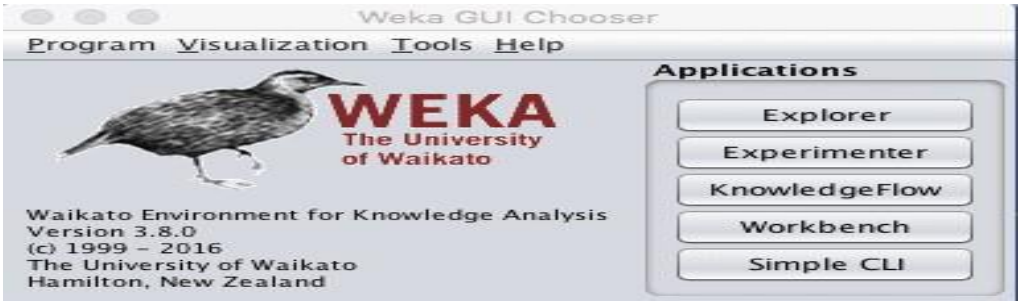
Viewer

Relation: Book1-weka.filters.unsupervised.attribute.Replacel

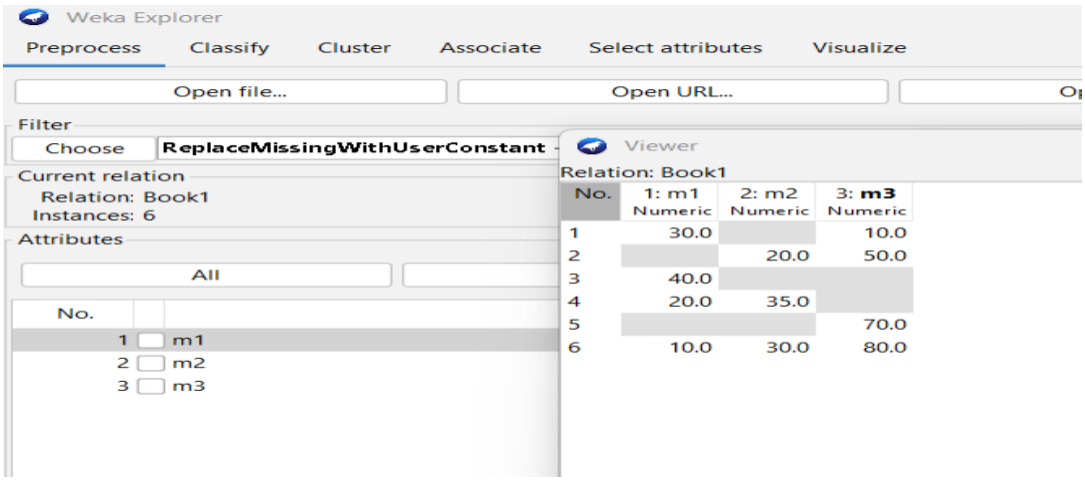
No.	1: m1 Numeric	2: m2 Numeric	3: **m3** Numeric
1	30.0	0.0	10.0
2	0.0	20.0	50.0
3	40.0	0.0	
4	20.0	35.0	
5	0.0	0.0	70.0
6	10.0	30.0	80.0

3.ReplaceMissingValues

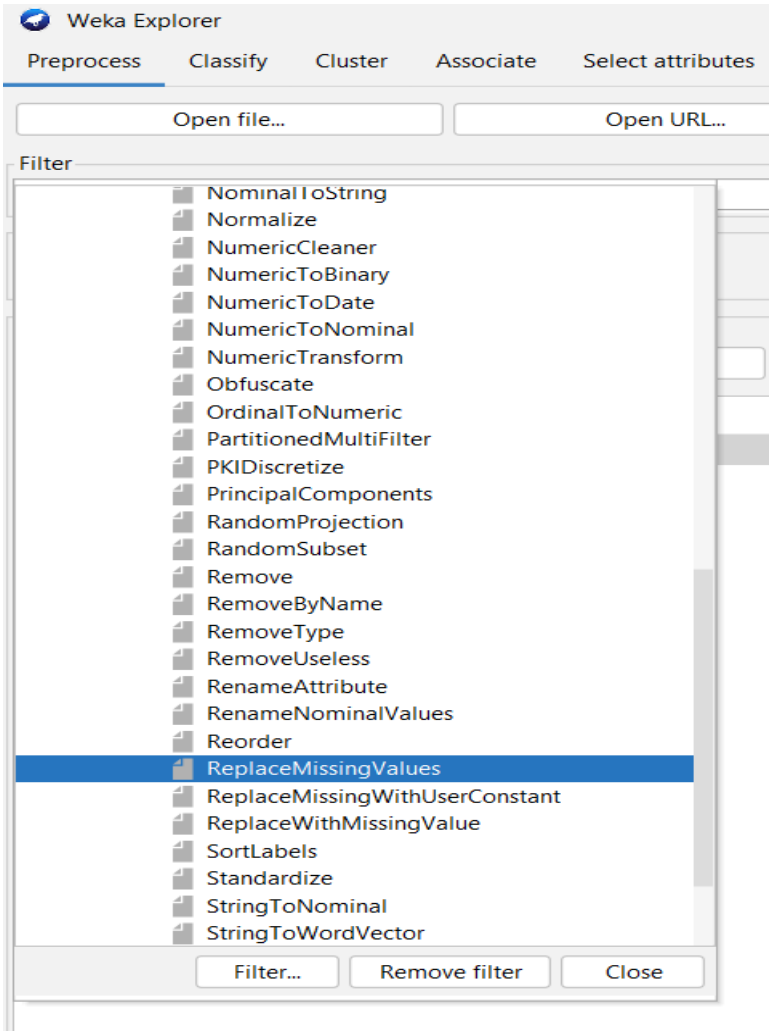
Start Weka and choose Explorer



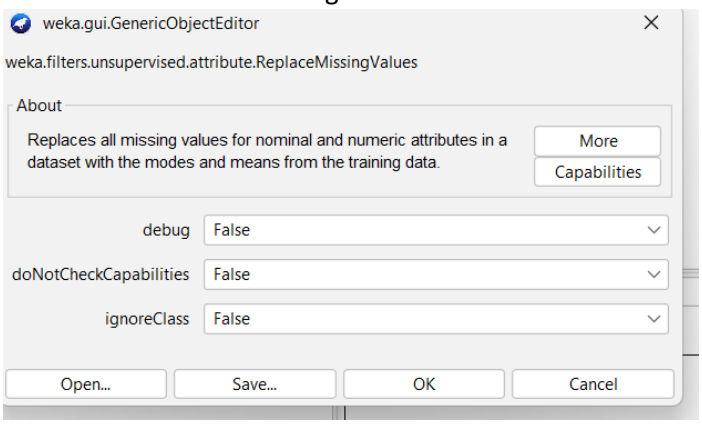
1. Load missing.csv data set.



2. Click "Choose" in tab Preproces -> Filter-> unsupervised->attribute->ReplaceMissingWithUserConstant which you will find in.



3.Click on filter tab to configure it

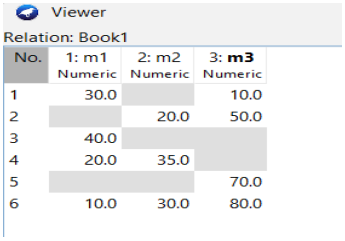


3. Set ignoreClass to True

4. Press "OK", in order to use filter configuration.

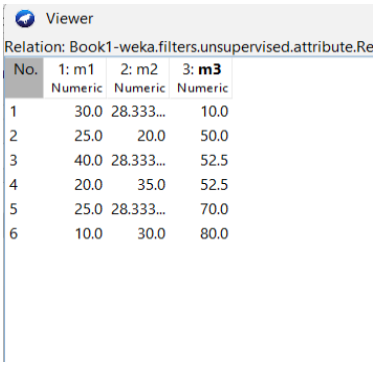
5. Press "Apply", in order to use selected filter.

Before applying result



No.	1: m1 Numeric	2: m2 Numeric	3: **m3** Numeric
1	30.0		10.0
2		20.0	50.0
3	40.0		
4	20.0	35.0	
5			70.0
6	10.0	30.0	80.0

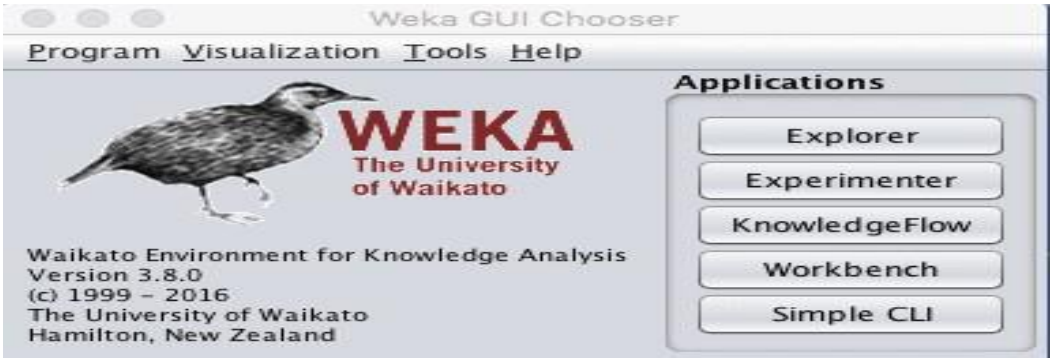
After Applying result



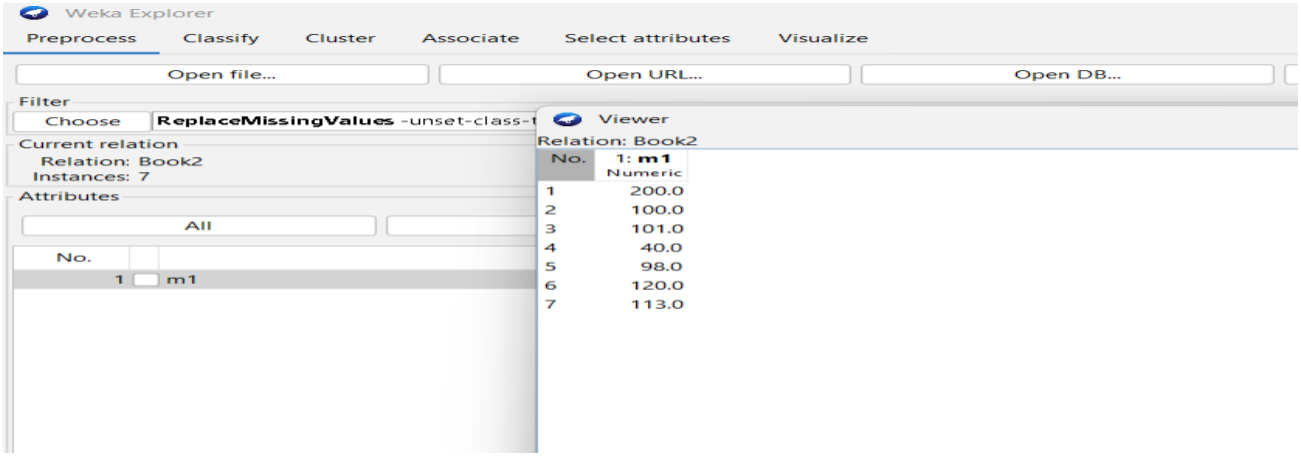
No.	1: m1 Numeric	2: m2 Numeric	3: **m3** Numeric
1	30.0	28.333...	10.0
2	25.0	20.0	50.0
3	40.0	28.333...	52.5
4	20.0	35.0	52.5
5	25.0	28.333...	70.0
6	10.0	30.0	80.0

Noisy Data- outlier / Extreme Values

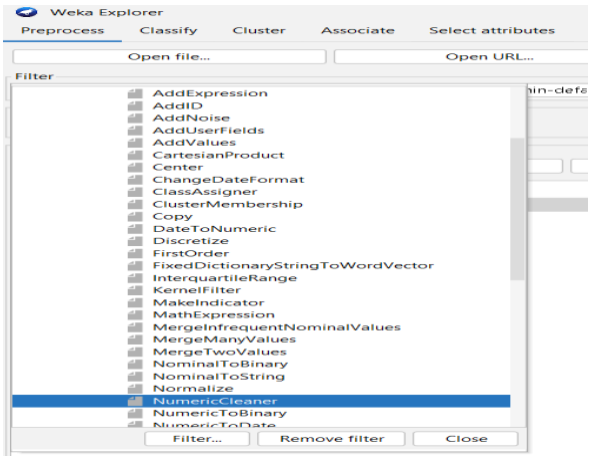
1. Start Weka and choose Explorer



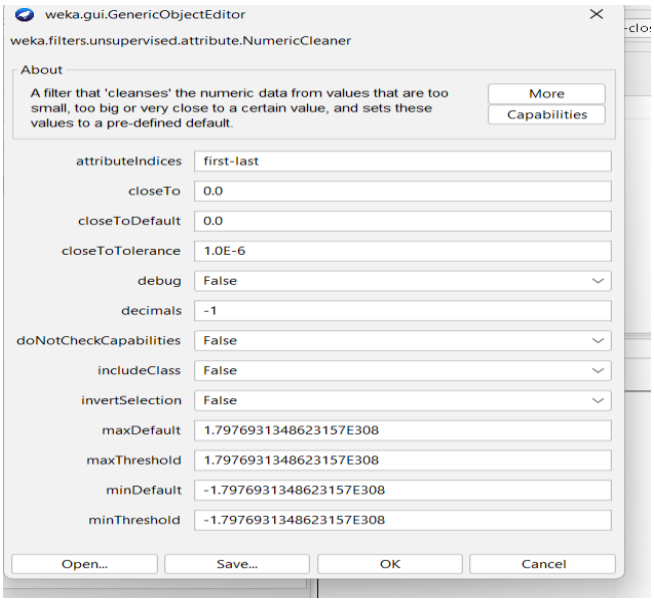
2. Load noisy.csv data set.



3. Click “Choose” in tab Preproces -> Filter-> unsupervised->attribute->NumericCleaner which you will find in.



4. Click on filter tab to configure it



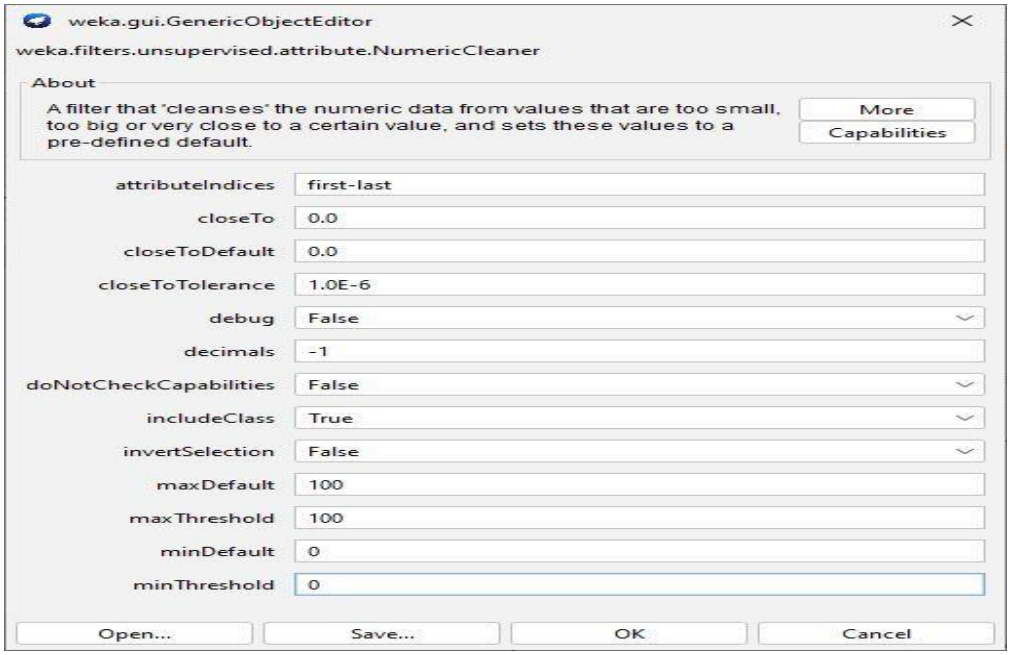
Set includeClass to True

5. Set maxDefault to 100

6. Set maxThreshold to 100

7. Set minDefault to 0

8. Set minThreshold to 0



9. Press "OK", in order to use filter configuration.

10. Press "Apply", in order to use selected filter.

11. Before applying result

Viewer

Relation: Book2

No.	1: **m1** Numeric
1	200.0
2	100.0
3	101.0
4	40.0
5	98.0
6	120.0
7	113.0

After Applying result

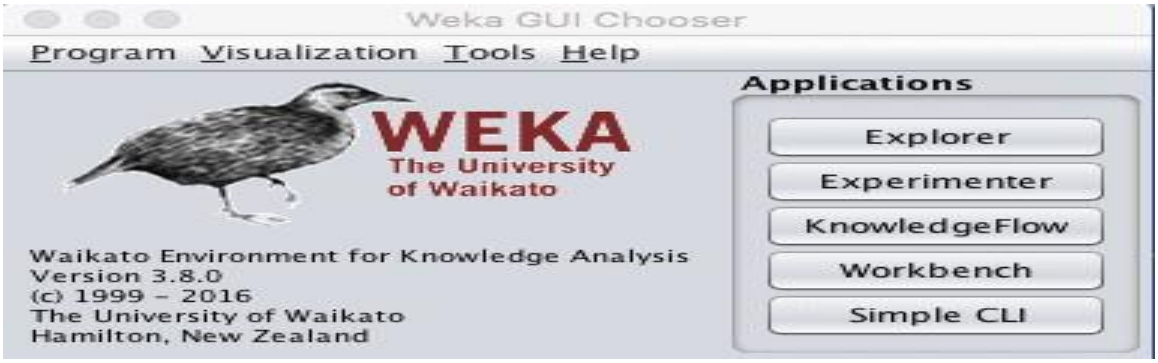
Viewer

Relation: Book2-weka.filters.unsupervised.attrit

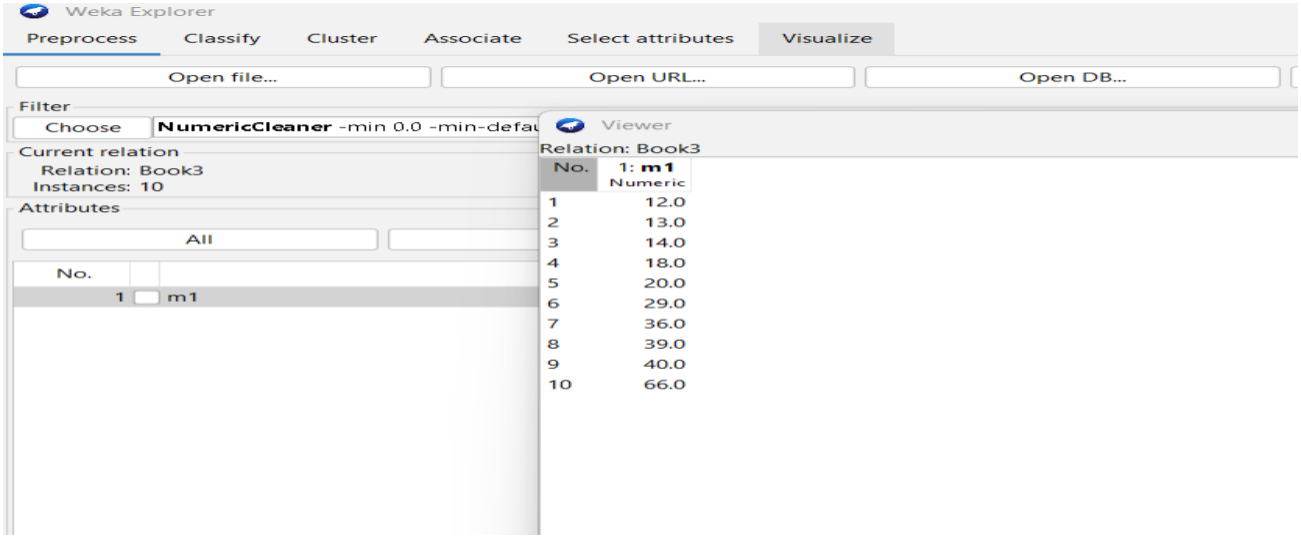
No.	1: **m1** Numeric
1	100.0
2	100.0
3	100.0
4	40.0
5	98.0
6	100.0
7	100.0

Discretization

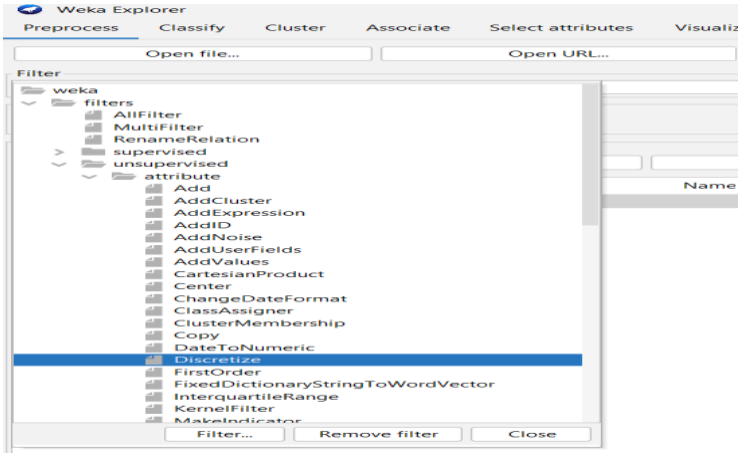
1. Start Weka and choose Explorer



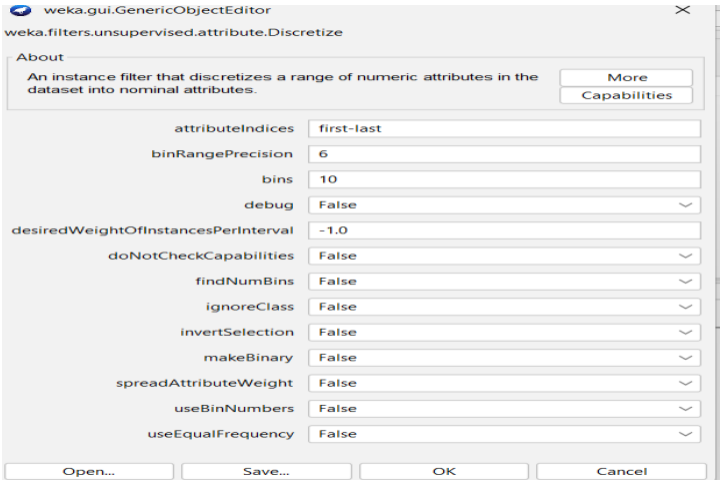
2. Load bin.csv data set.



3. Click “Choose” in tab Preproces -> Filter-> unsupervised->attribute->Discretize which you will find in.



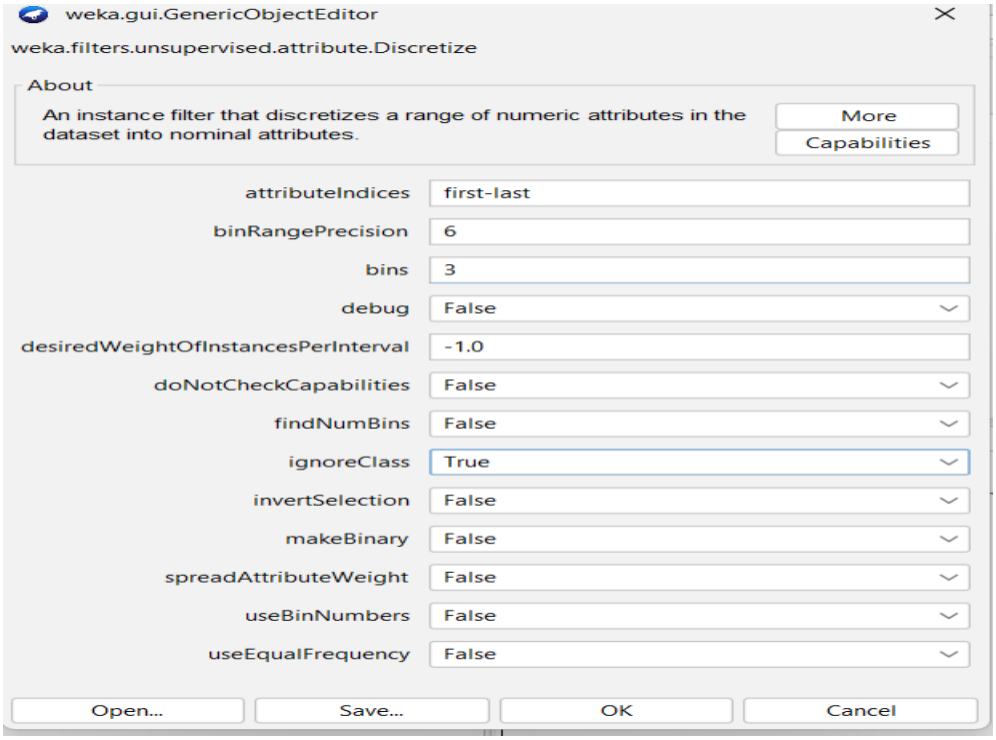
4.Click on filter tab to configure it



5.Set attributeIndices to first-last

4. set bins to 3

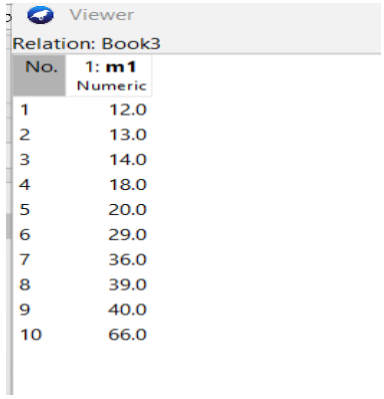
5. Set igonreClass to True



6. Press "OK", in order to use filter configuration.

7. Press "Apply", in order to use selected filter.

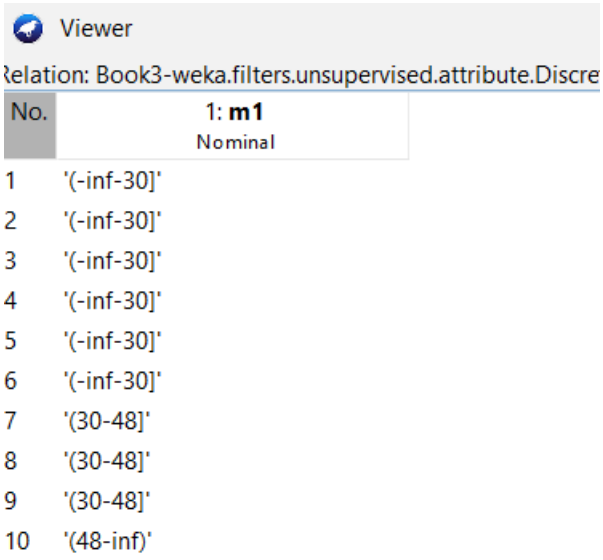
Before applying result


Viewer

Relation: Book3

No.	1: m1 Numeric
1	12.0
2	13.0
3	14.0
4	18.0
5	20.0
6	29.0
7	36.0
8	39.0
9	40.0
10	66.0

After applying result


Viewer

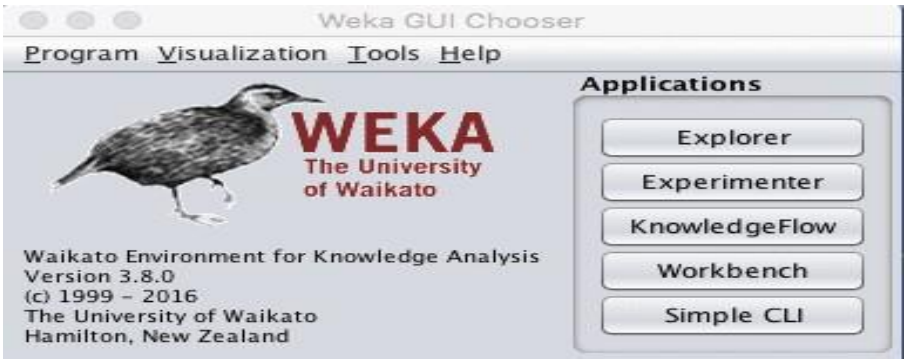
Relation: Book3-weka.filters.unsupervised.attribute.Discre

No.	1: m1 Nominal
1	'(-inf-30]'
2	'(-inf-30]'
3	'(-inf-30]'
4	'(-inf-30]'
5	'(-inf-30]'
6	'(-inf-30]'
7	'(30-48]'
8	'(30-48]'
9	'(30-48]'
10	'(48-inf)'

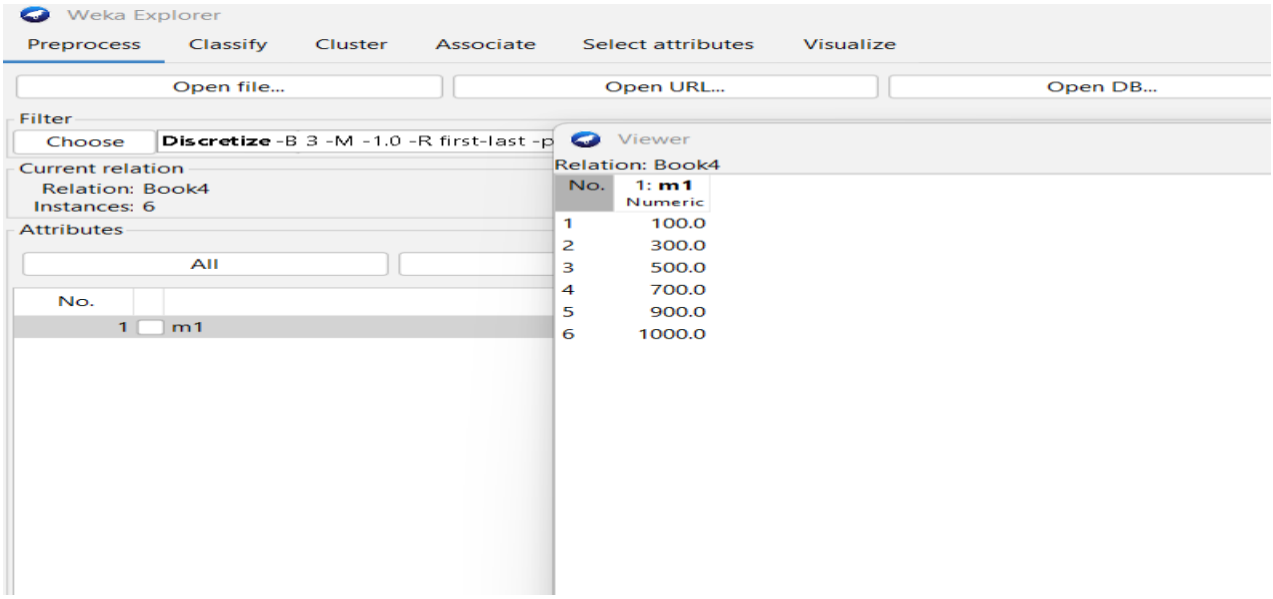
Normalization

Min-Max-Normalization

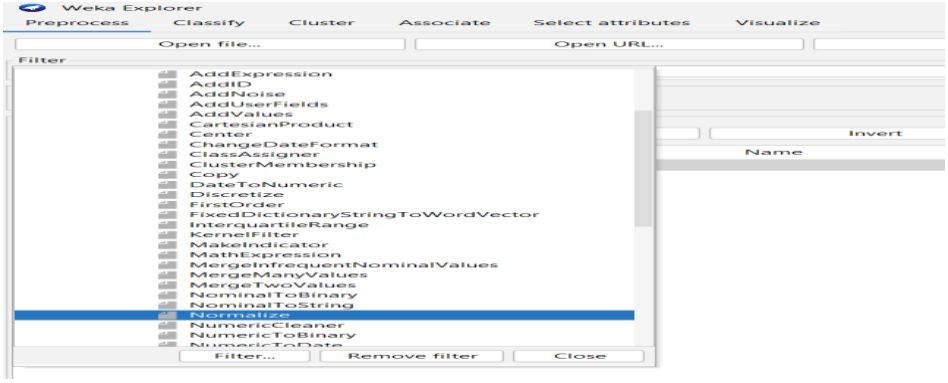
1. Start Weka and choose Explorer



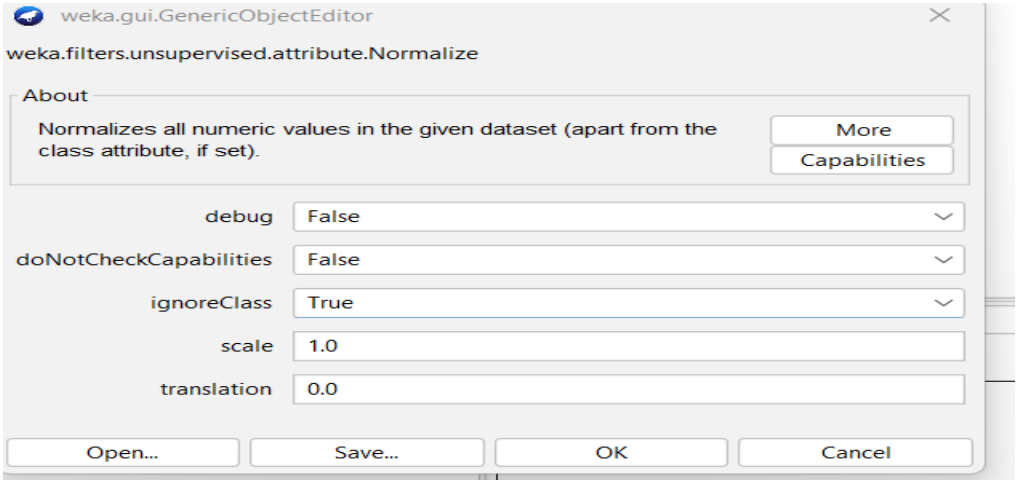
2. Load bin.csv data set.



3. Click “Choose” in tab Preproces -> Filter-> unsupervised->attribute->Normalize which you will find in.



4. Click on filter tab to configure it

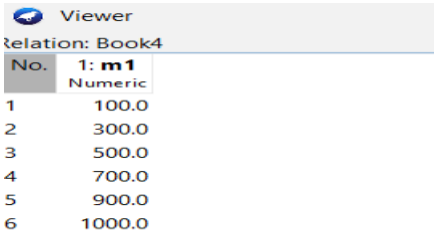


5. Set igonreClass to True

6. Press "OK", in order to use filter configuration.

7. Press "Apply", in order to use selected filter.

Before applying result



After applying result

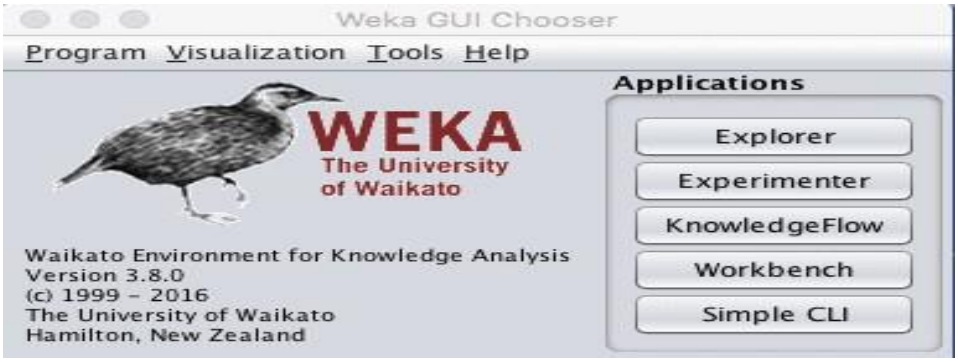
Viewer

Relation: Book4-weka.filters.unsupervised.a

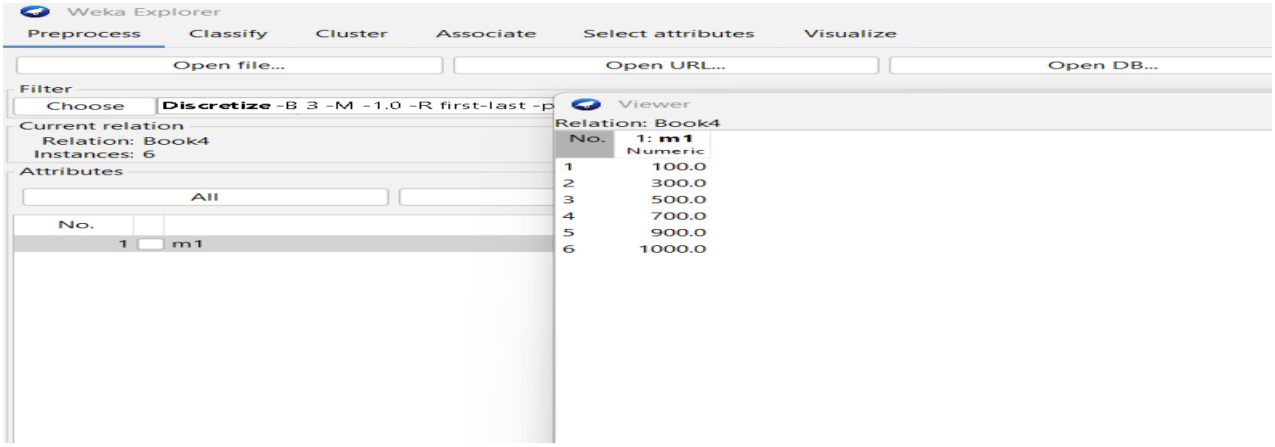
No.	1: **m1** Numeric
1	0.0
2	0.2222...
3	0.4444...
4	0.6666...
5	0.8888...
6	1.0

Z-Score-Normalization

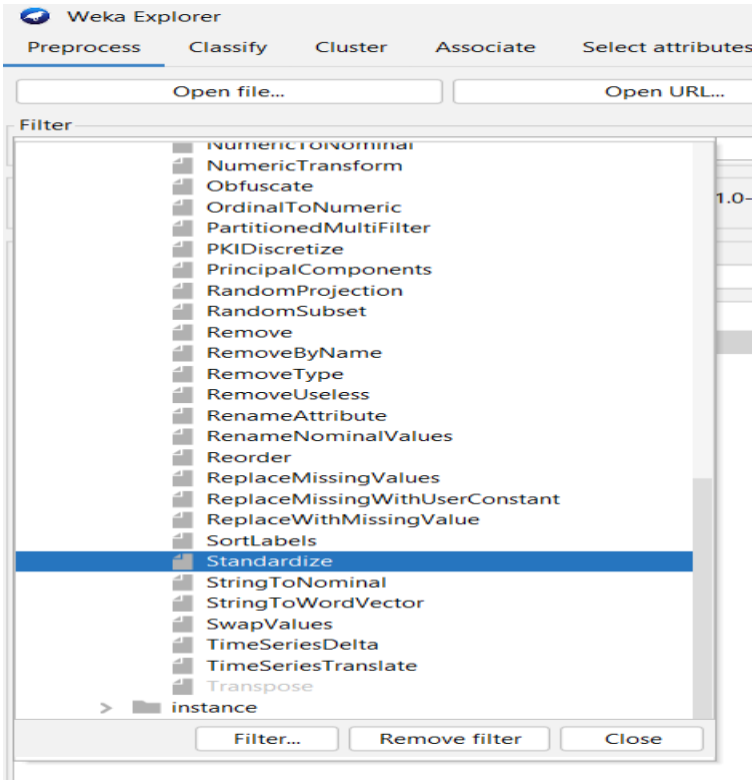
1. Start Weka and choose Explorer



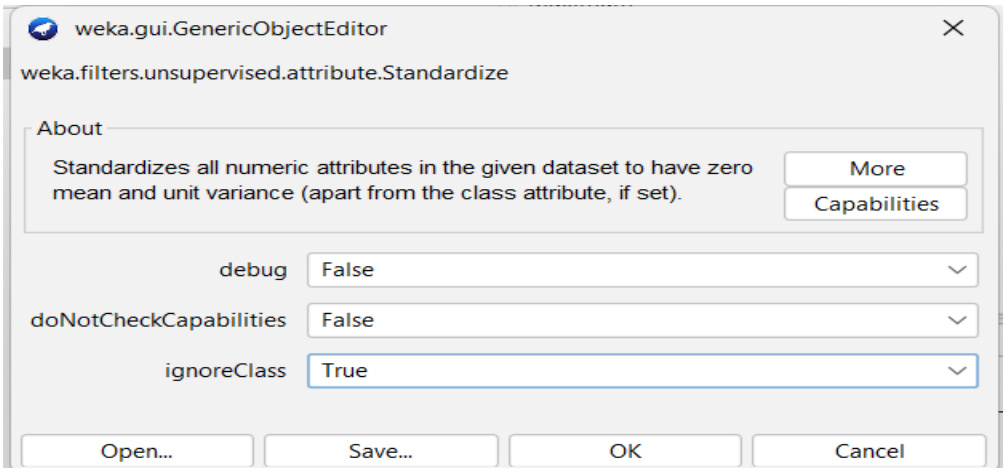
2. Load bin.csv data set.



Click “Choose” in tab Preproces -> Filter-> unsupervised->attribute->Standardize which you will find in.



3. Click on filter tab to configure it



4. Set igonreClass to True

5. Press "OK", in order to use filter configuration.

6. Press "Apply", in order to use selected filter.

Before applying result

Viewer

Relation: Book4

No.	1: **m1** Numeric
1	100.0
2	300.0
3	500.0
4	700.0
5	900.0
6	1000.0

After applying result

Viewer

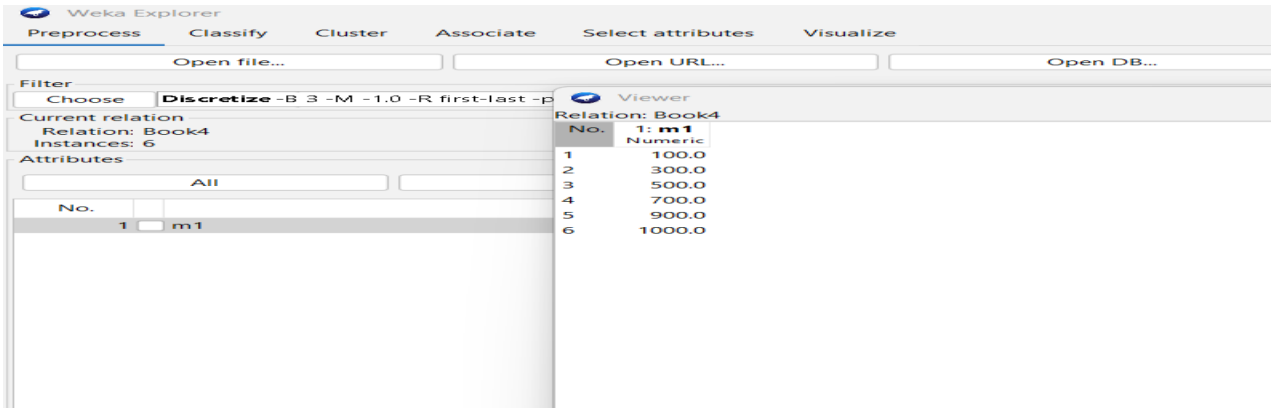
Relation: Book4-weka.filters.unsupervised.attribu

No.	1: **m1** Numeric
1	-1.385...
2	-0.812...
3	-0.238...
4	0.3344...
5	0.9078...
6	1.1945...

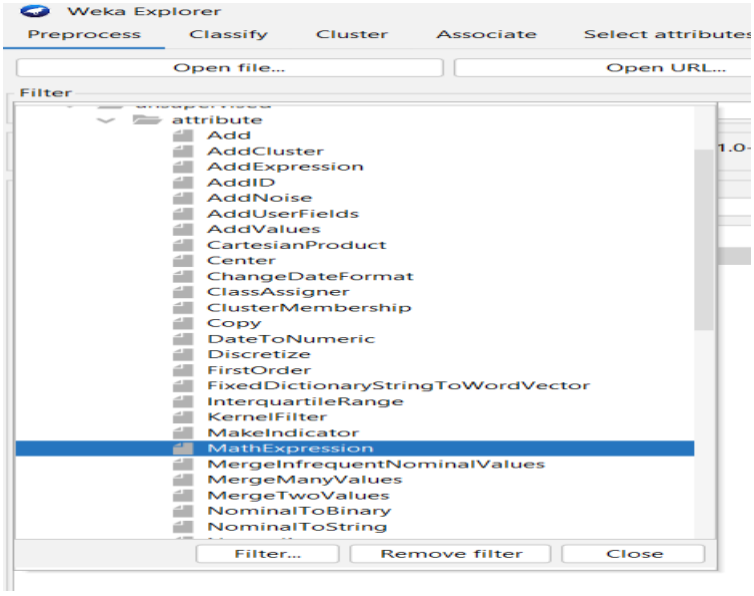
Decimal-Scale-Normalization

1. Start Weka and choose Explorer

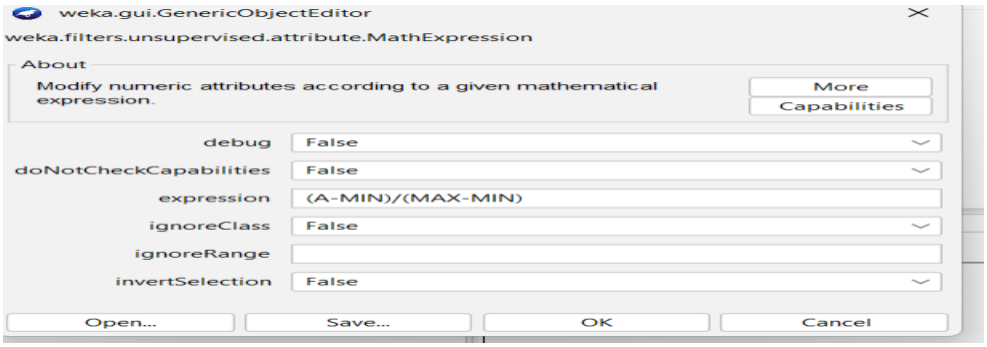
2. Load bin.csv data set.



3. Click “Choose” in tab Preproces -> Filter-> unsupervised->attribute->MathExpression which you will find in.



4. Click on filter tab to configure it to specify expression

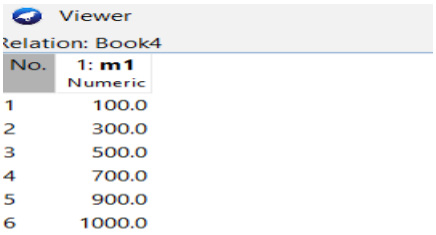


5. Set igonreClass to True

6. Press "OK", in order to use filter configuration.

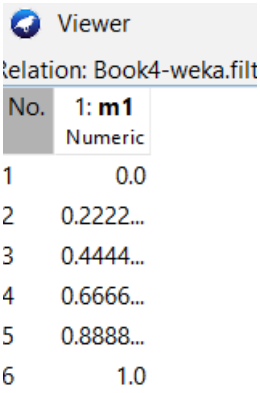
7. Press "Apply", in order to use selected filter.

8. Before applying result


Viewer
Relation: Book4

No.	1: m1 Numeric
1	100.0
2	300.0
3	500.0
4	700.0
5	900.0
6	1000.0

After applying result

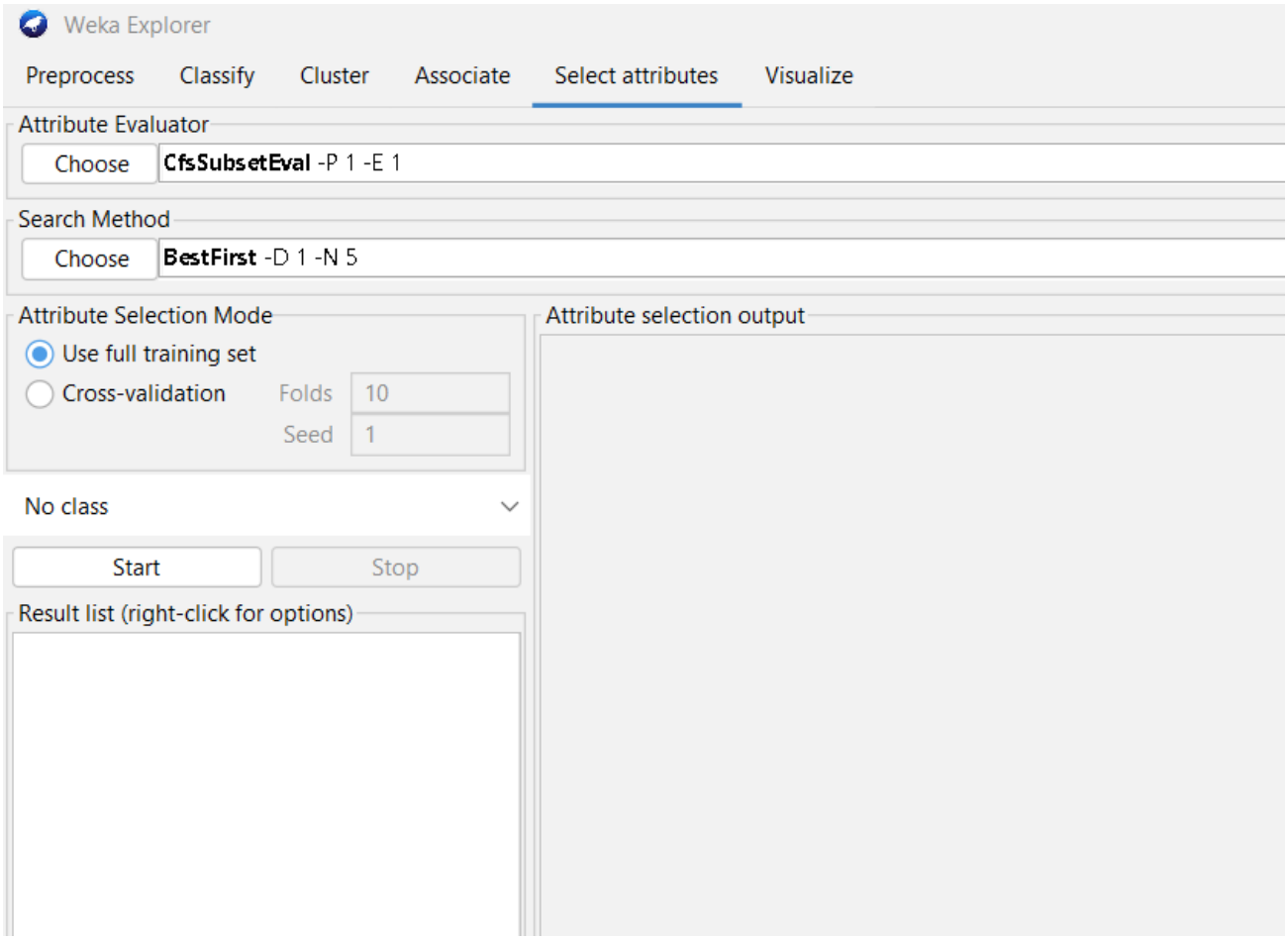

Viewer
Relation: Book4-weka.filt

No.	1: m1 Numeric
1	0.0
2	0.2222...
3	0.4444...
4	0.6666...
5	0.8888...
6	1.0

Feature Selection-Measure

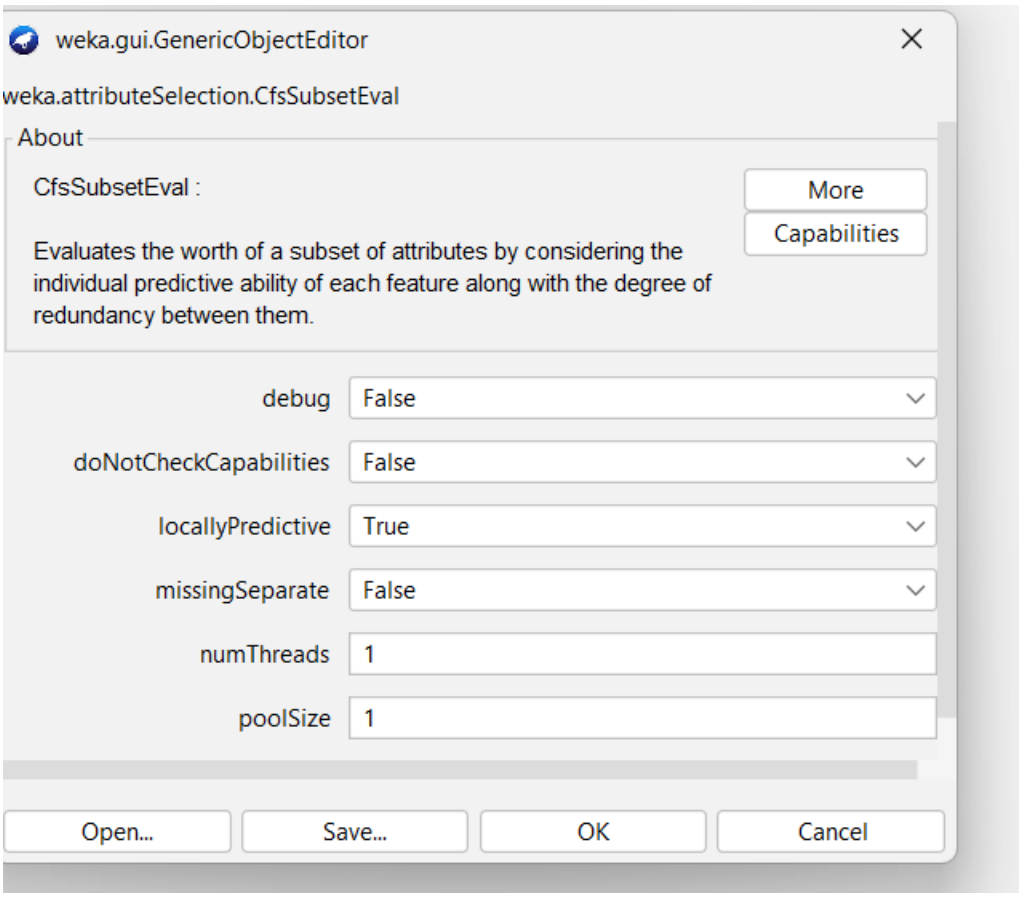
Correlation Based Feature Selection

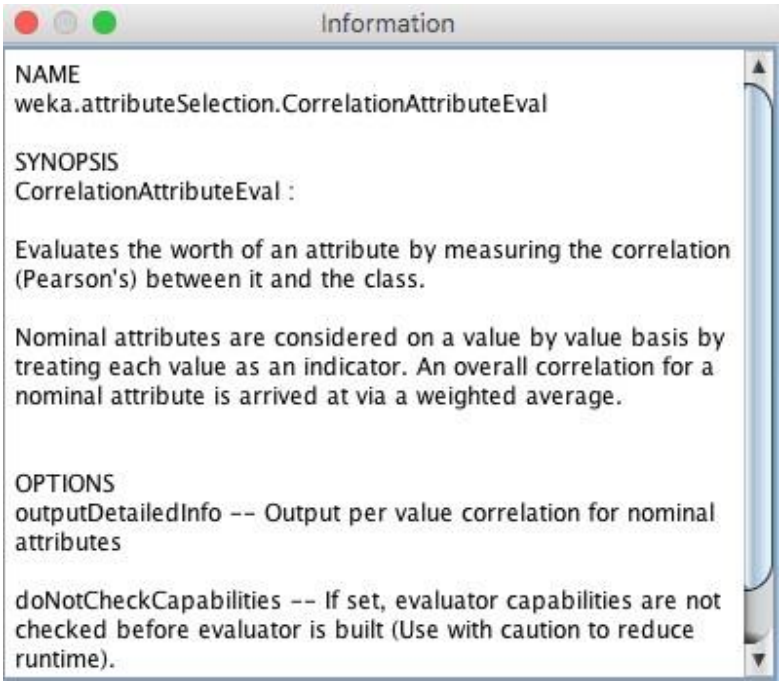
1. Open the Weka GUI Chooser.
2. Click the “Explorer” button to launch the Explorer.
3. Open the Pima Indians dataset.
4. Click the “Select attributes” tab to access the feature selection methods.

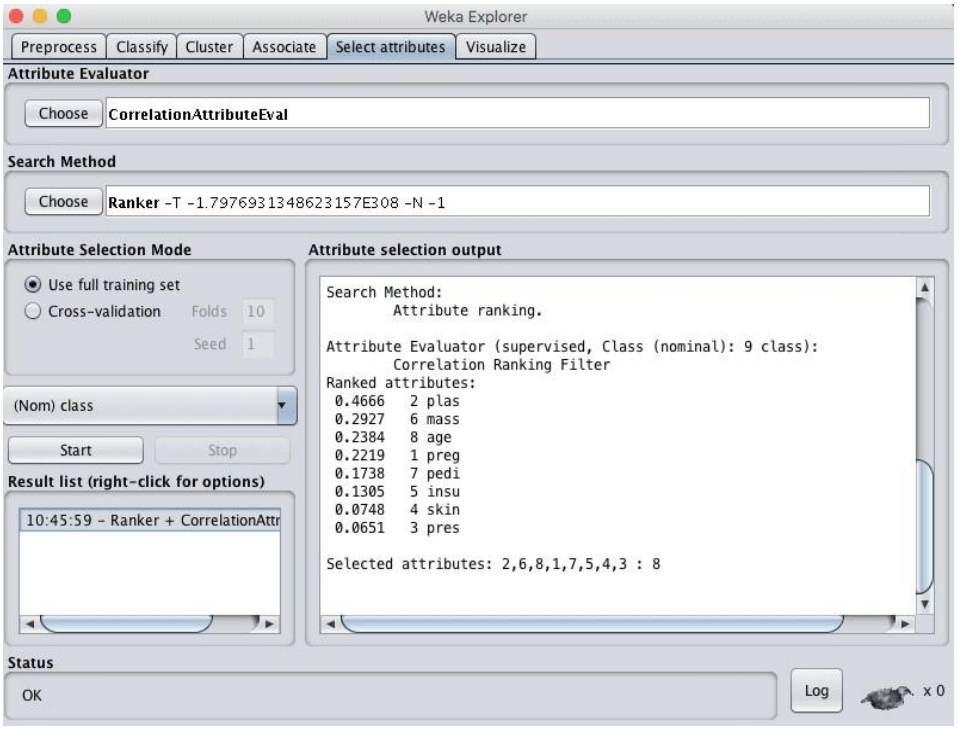


Feature selection is divided into two parts:

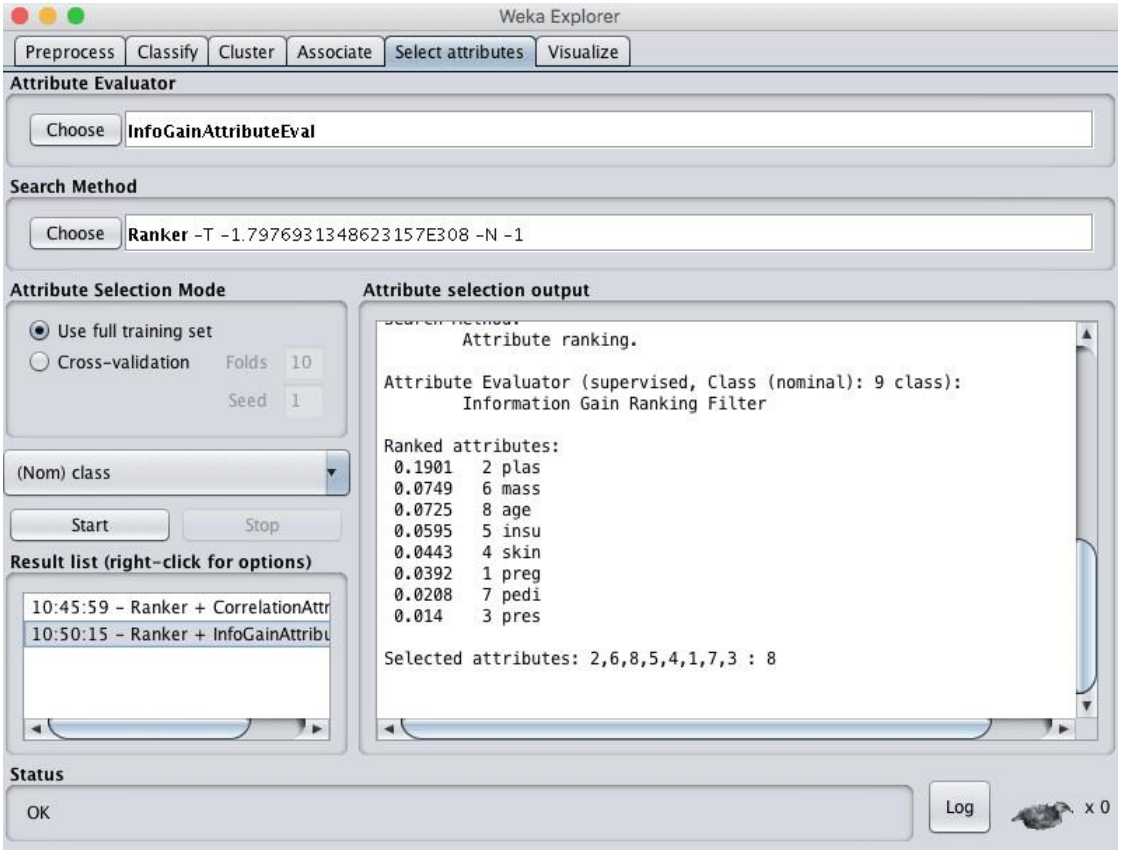
- Attribute Evaluator
- Search Method.


weka.gui.GenericObjectEditor
weka.attributeSelection.CfsSubsetEval
About
CfsSubsetEval :
Evaluates the worth of a subset of attributes by considering the individual predictive ability of each feature along with the degree of redundancy between them.
More
Capabilities
debug
False
doNotCheckCapabilities
False
locallyPredictive
True
missingSeparate
False
numThreads
1
poolSize
1
Open...
Save...
OK
Cancel


Information
NAME
weka.attributeSelection.CorrelationAttributeEval
SYNOPSIS
CorrelationAttributeEval :
Evaluates the worth of an attribute by measuring the correlation (Pearson's) between it and the class.
Nominal attributes are considered on a value by value basis by treating each value as an indicator. An overall correlation for a nominal attribute is arrived at via a weighted average.
OPTIONS
outputDetailedInfo -- Output per value correlation for nominal attributes
doNotCheckCapabilities -- If set, evaluator capabilities are not checked before evaluator is built (Use with caution to reduce runtime).



Information Gain Based Feature Selection



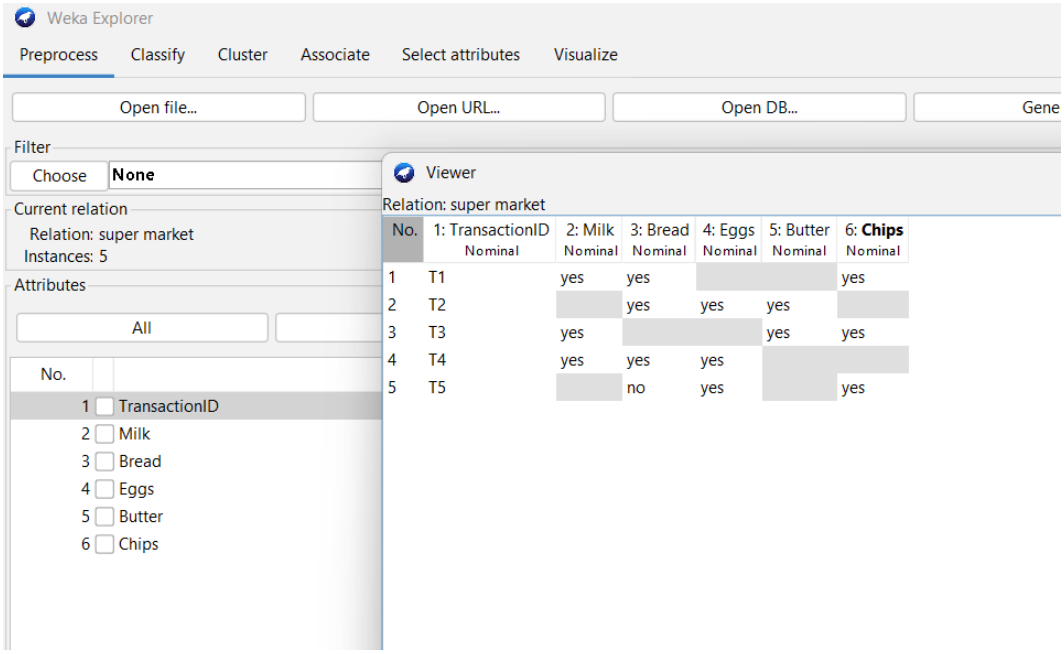
Association:

1)open the weka tool

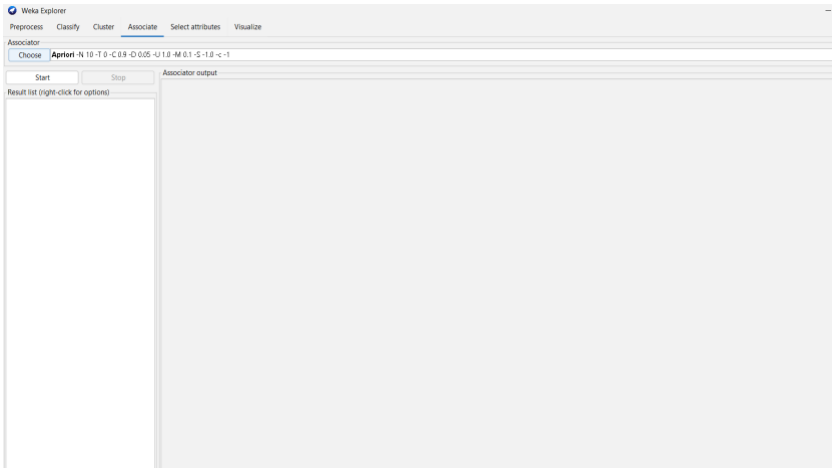
2)create a csv file

	A	B	C	D	E	F	G
1	**TransactionID**	**Milk**	**Bread**	**Eggs**	**Butter**	**Chips**	
2	T1	yes	yes			yes	
3	T2		yes	yes	yes		
4	T3	yes			yes	yes	
5	T4	yes	yes	yes			
6	T5		no	yes		yes	
7							
8							
9							

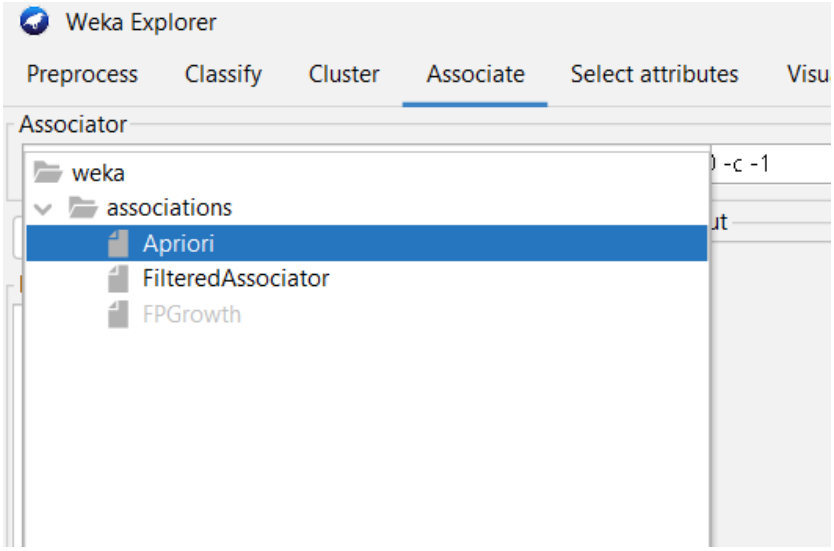
3)open the csv file in weka tool



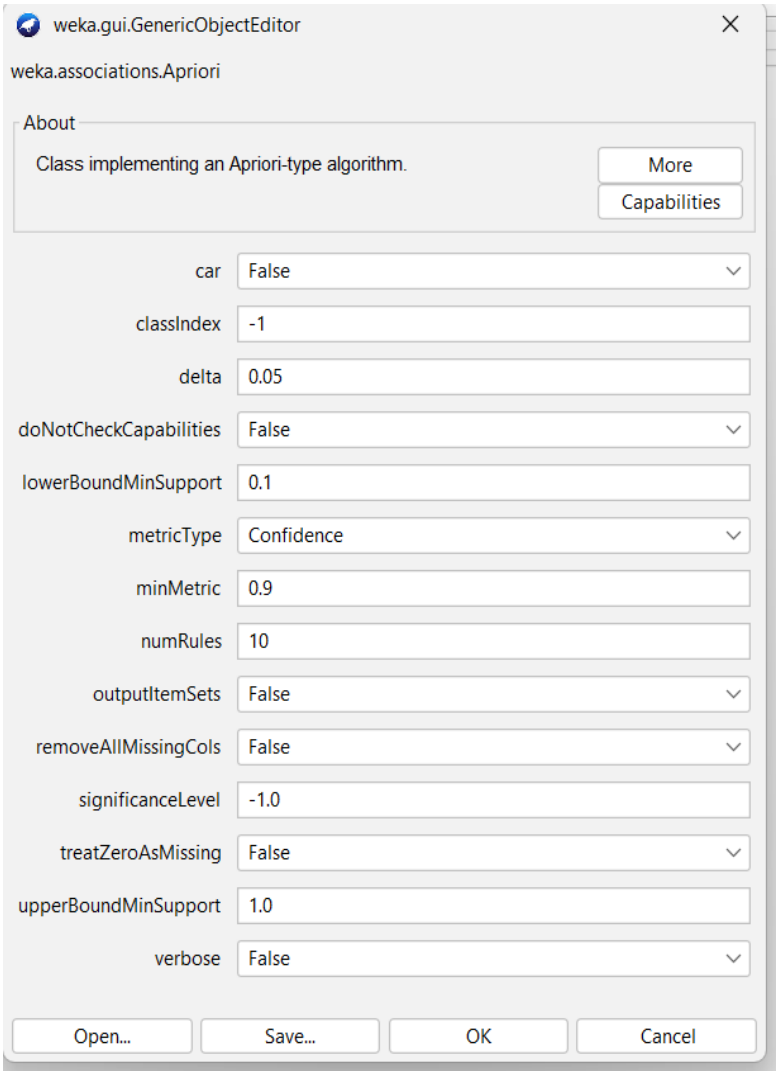
4)select the Associate option



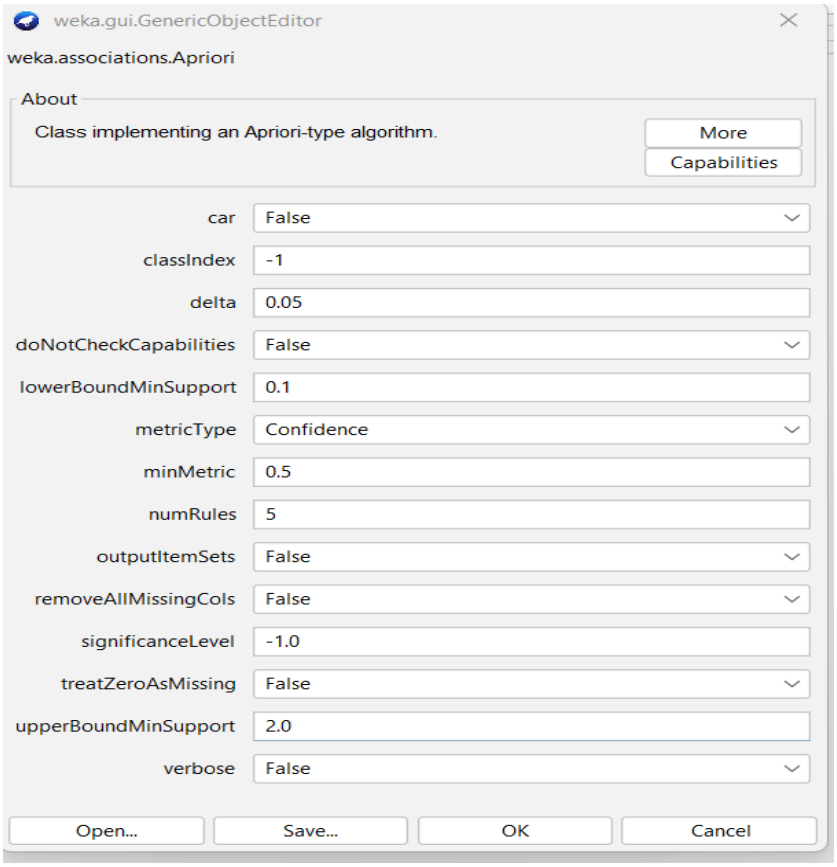
5)Click “choose” in tab associate->Apriori



6)Click on filter tab to configure it



7)set upper bound min support 2.0
8)set num rules 5
9)set min metric 0.5



10)Press “ok”,in order to use filter configuration.
11)press “start”,In order to use selected filter
Associate output:

Associator output

```
=== Run information ===

Scheme:       weka.associations.Apriori -N 5 -T 0 -C 0.5 -D 0.05 -U 2.0 -M 0.1 -S -1.0 -c -1
Relation:     super market
Instances:    5
Attributes:   6
              TransactionID
              Milk
              Bread
              Eggs
              Butter
              Chips
=== Associator model (full training set) ===


Apriori
=======

Minimum support: 0.5 (2 instances)
Minimum metric <confidence>: 0.5
Number of cycles performed: 10

Generated sets of large itemsets:

Size of set of large itemsets L(1): 5

Size of set of large itemsets L(2): 3

Best rules found:

1. Bread=yes 3 ==> Milk=yes 2    <conf:(0.67)> lift:(1.11) lev:(0.04) [0] conv:(0.6)
2. Milk=yes 3 ==> Bread=yes 2    <conf:(0.67)> lift:(1.11) lev:(0.04) [0] conv:(0.6)
3. Chips=yes 3 ==> Milk=yes 2    <conf:(0.67)> lift:(1.11) lev:(0.04) [0] conv:(0.6)
4. Milk=yes 3 ==> Chips=yes 2    <conf:(0.67)> lift:(1.11) lev:(0.04) [0] conv:(0.6)
5. Eggs=yes 3 ==> Bread=yes 2    <conf:(0.67)> lift:(1.11) lev:(0.04) [0] conv:(0.6)
```

Set numrules 10

Output:

Associator output

```
=== Run information ===

Scheme:       weka.associations.Apriori -N 10 -T 0 -C 0.5 -D 0.05 -U 2.0 -M 0.1 -S -1.0 -c -1
Relation:     super market
Instances:    5
Attributes:   6
              TransactionID
              Milk
              Bread
              Eggs
              Butter
              Chips
=== Associator model (full training set) ===


Apriori
=======

Minimum support: 0.3 (1 instances)
Minimum metric <confidence>: 0.5
Number of cycles performed: 14

Generated sets of large itemsets:

Size of set of large itemsets L(1): 11

Size of set of large itemsets L(2): 27

Size of set of large itemsets L(3): 20

Size of set of large itemsets L(4): 5

Best rules found:

 1. TransactionID=T1 1 ==> Milk=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
 2. TransactionID=T1 1 ==> Bread=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
 3. TransactionID=T1 1 ==> Chips=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
 4. TransactionID=T2 1 ==> Bread=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
 5. TransactionID=T2 1 ==> Eggs=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
 6. TransactionID=T2 1 ==> Butter=yes 1    <conf:(1)> lift:(2.5) lev:(0.12) [0] conv:(0.6)
 7. TransactionID=T3 1 ==> Milk=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
 8. TransactionID=T3 1 ==> Butter=yes 1    <conf:(1)> lift:(2.5) lev:(0.12) [0] conv:(0.6)
 9. TransactionID=T3 1 ==> Chips=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
10. TransactionID=T4 1 ==> Milk=yes 1    <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
```

Output:

=== Run information ===

Scheme: weka.associations.Apriori -N 10 -T 0 -C 0.5 -D 0.05 -U 2.0 -M 0.1 -S -1.0 -c -1

Relation: super market

Instances: 5

Attributes: 6

TransactionID

Milk

Bread

Eggs
Butter
Chips
=== Associator model (full training set) ===

Apriori
=======

Minimum support: 0.3 (1 instances)
Minimum metric <confidence>: 0.5
Number of cycles performed: 14

Generated sets of large itemsets:

Size of set of large itemsets L(1): 11

Size of set of large itemsets L(2): 27

Size of set of large itemsets L(3): 20

Size of set of large itemsets L(4): 5

Best rules found:

1. TransactionID=T1 1 ==> Milk=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
2. TransactionID=T1 1 ==> Bread=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
3. TransactionID=T1 1 ==> Chips=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
4. TransactionID=T2 1 ==> Bread=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
5. TransactionID=T2 1 ==> Eggs=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
6. TransactionID=T2 1 ==> Butter=yes 1 <conf:(1)> lift:(2.5) lev:(0.12) [0] conv:(0.6)
7. TransactionID=T3 1 ==> Milk=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
8. TransactionID=T3 1 ==> Butter=yes 1 <conf:(1)> lift:(2.5) lev:(0.12) [0] conv:(0.6)
9. TransactionID=T3 1 ==> Chips=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] conv:(0.4)
10. TransactionID=T4 1 ==> Milk=yes 1 <conf:(1)> lift:(1.67) lev:(0.08) [0] con