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**Class:** Msc CS Part I **Roll no:**46

**Subject:** Business Intelligence and Big Data Analytics

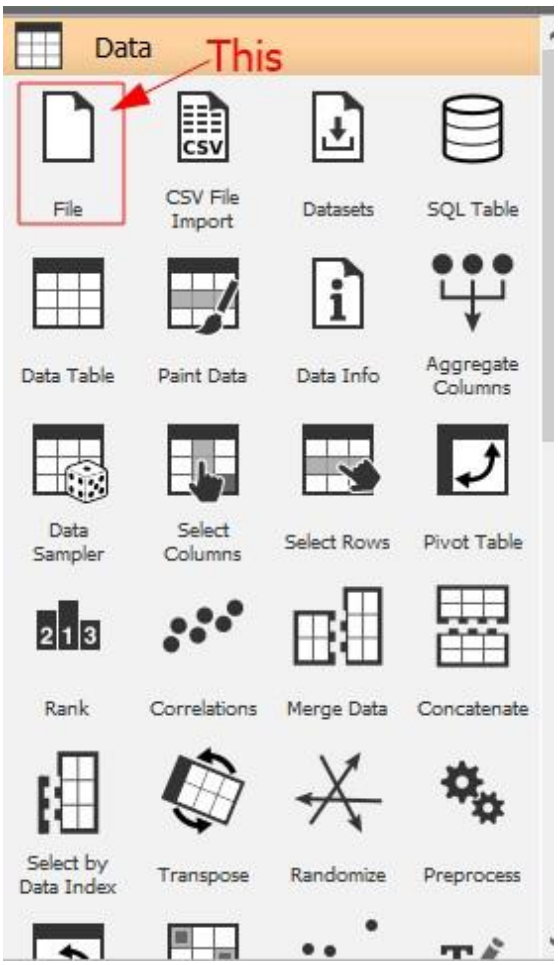
## Index

# Practical 1

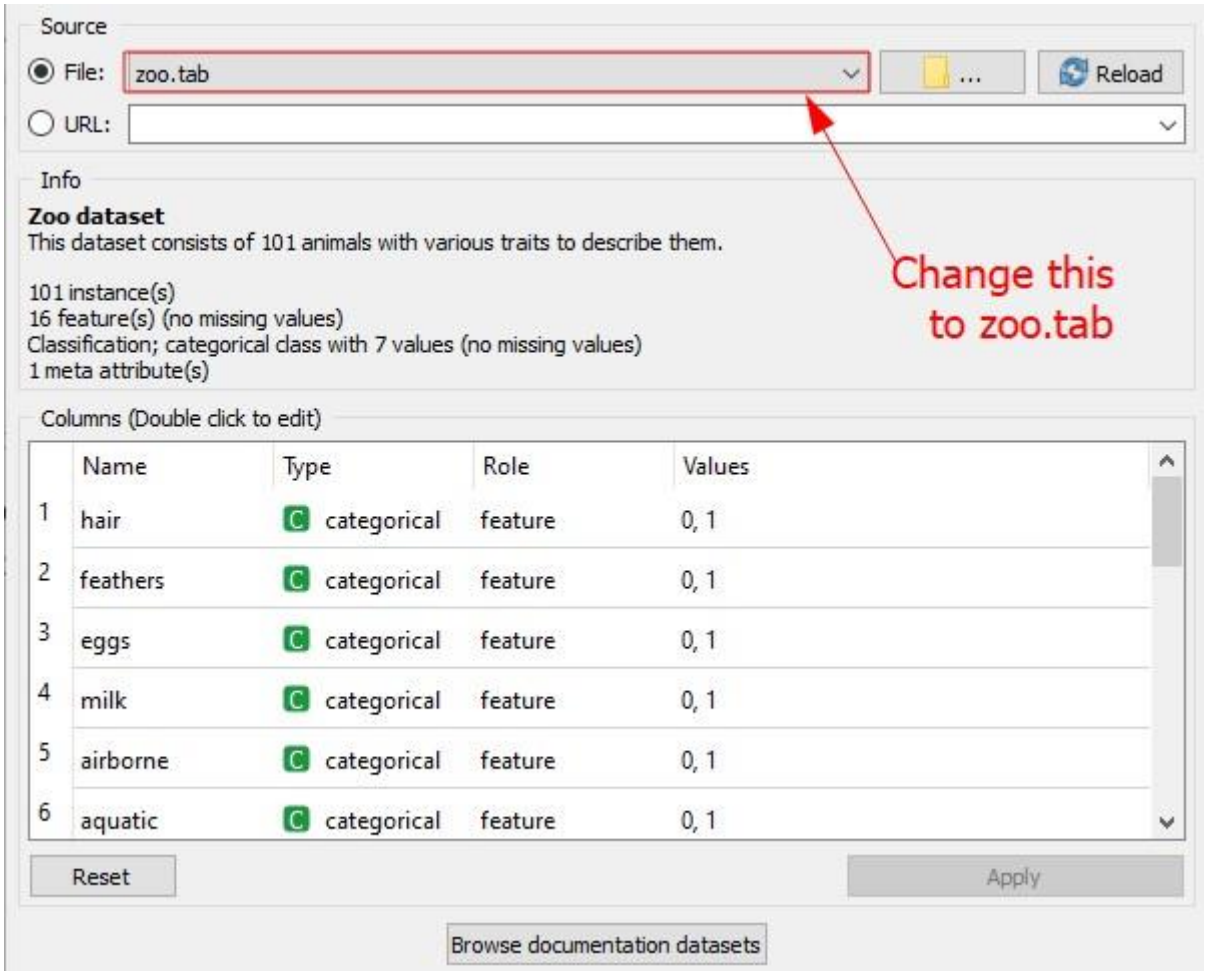
**Aim:** Classification using orange.

**Steps:**

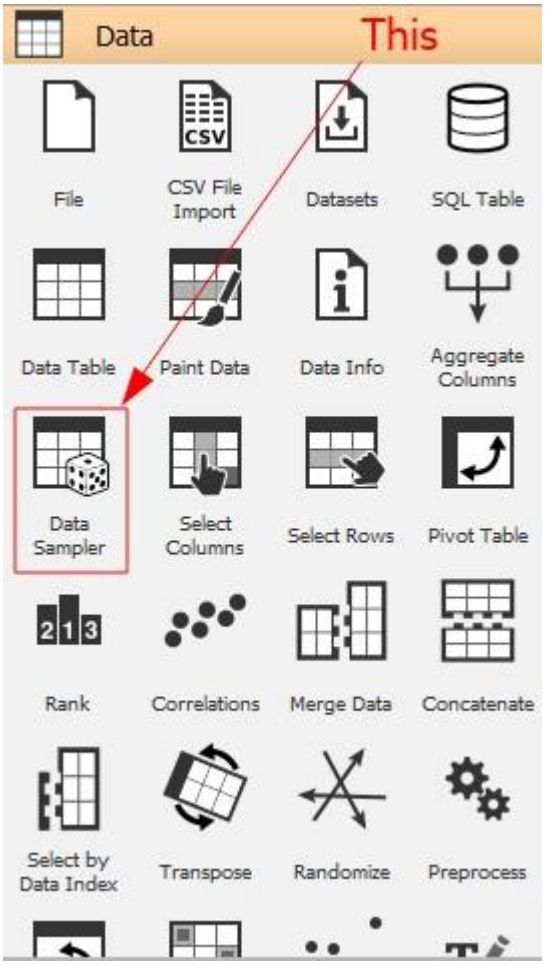
➢ Drag and drop a File widget from the Data section found in the left panel to the workspace.

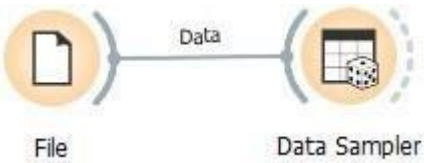



➢ Double click the File widget and choose the zoo.tab dataset.

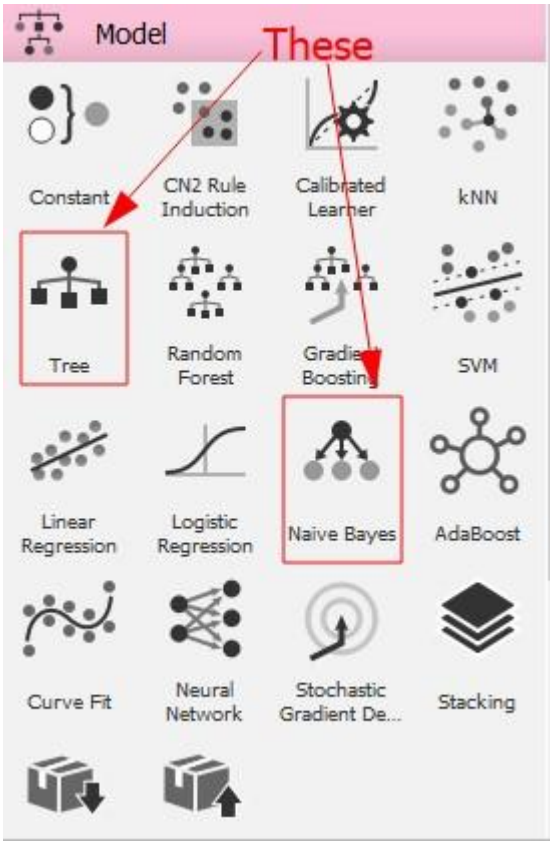


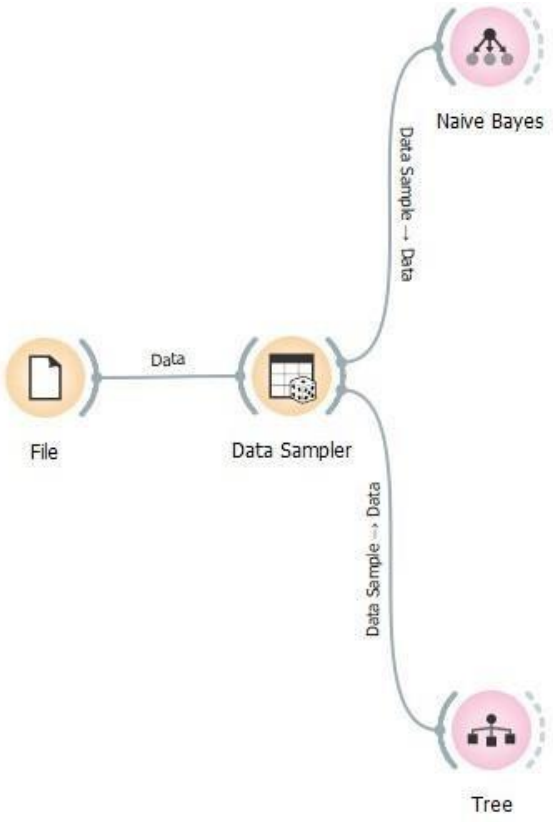

➢ Drag and drop a Data Sampler widget onto the workspace and connect it to the File widget. This widget is found in the Data section.


Data
This
File
CSV File Import
Datasets
SQL Table
Data Table
Paint Data
Data Info
Aggregate Columns
Data Sampler
Select Columns
Select Rows
Pivot Table
Rank
Correlations
Merge Data
Concatenate
Select by Data Index
Transpose
Randomize
Preprocess

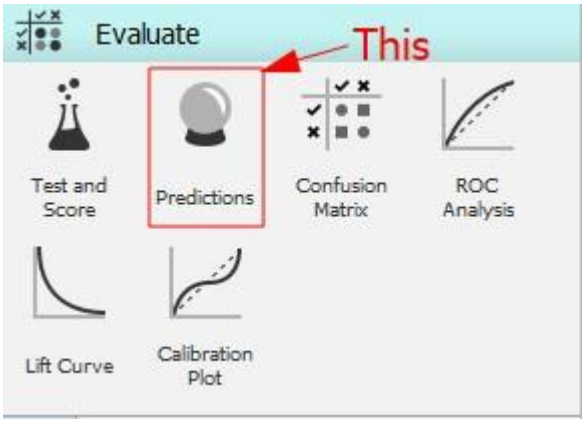

Data
File
Data Sampler

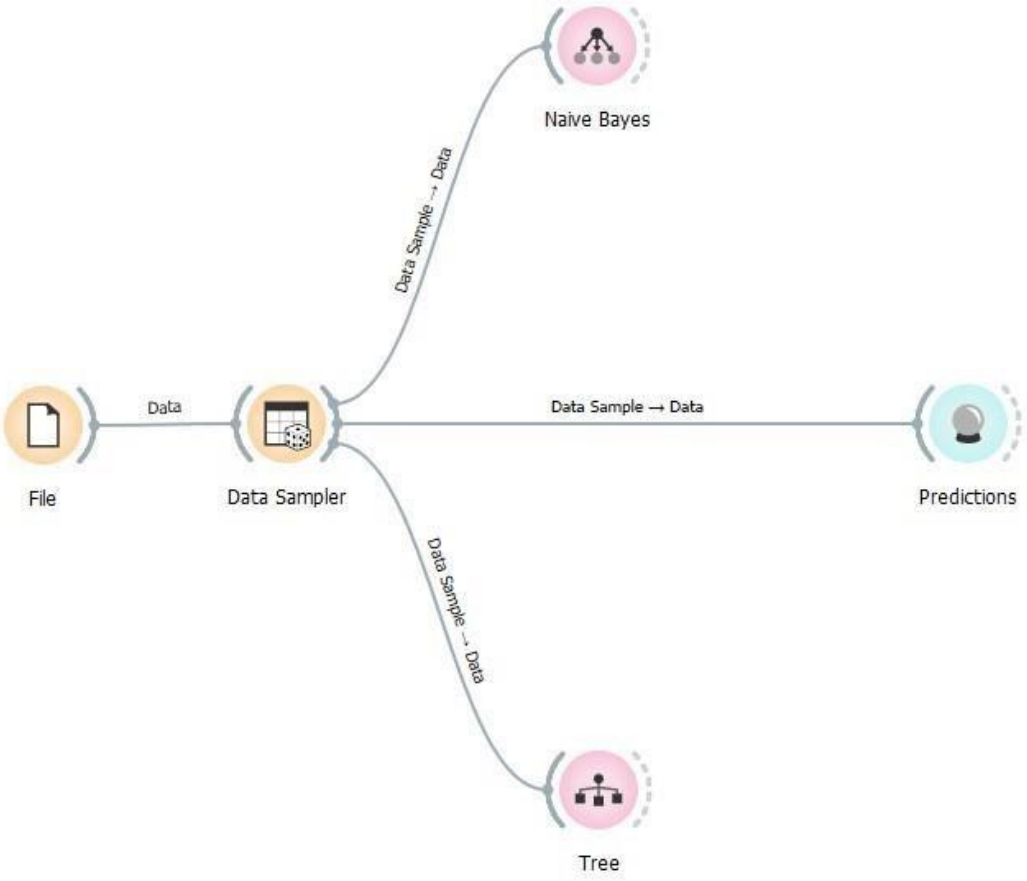
➢ We choose the Naive Bayes' and Classification Tree models to classify our data. Drag and drop these widgets to the workspace. They are found under the Models section.



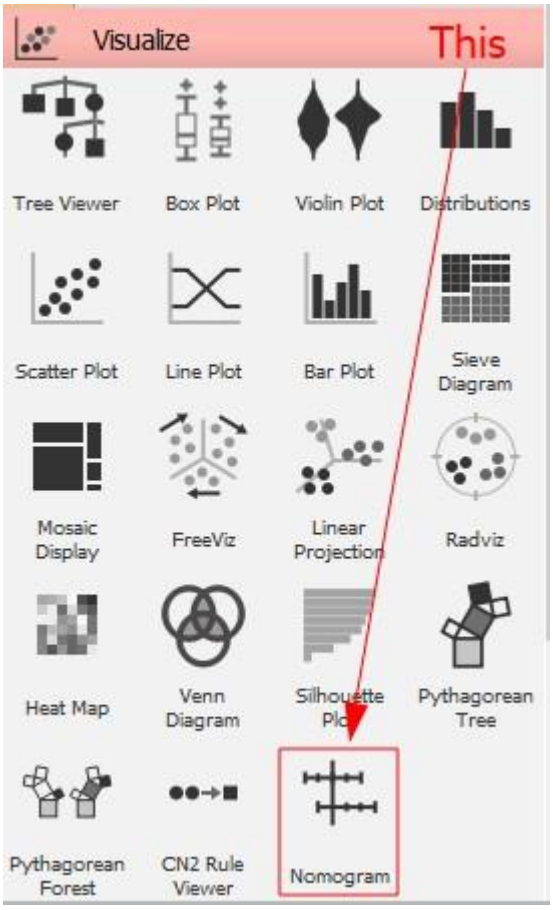


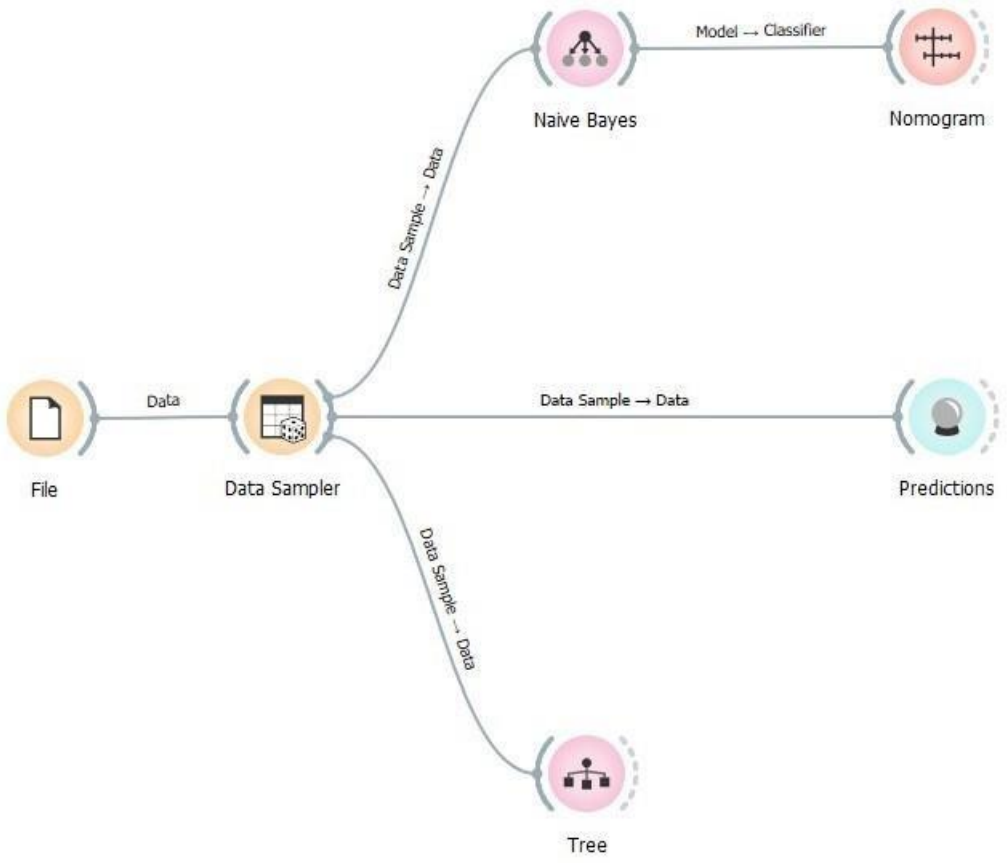

➢ To perform predictions on the data, we drag and drop the Predictions widget onto the workspace.This widget is found in the Evaluate section.



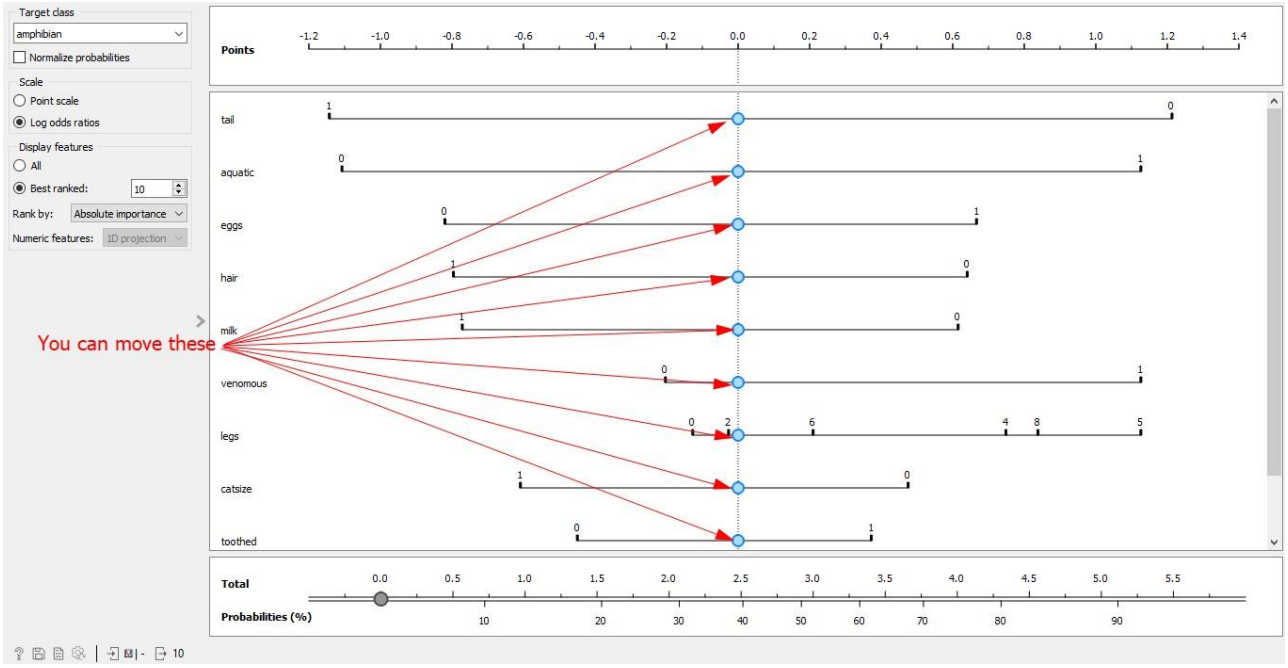


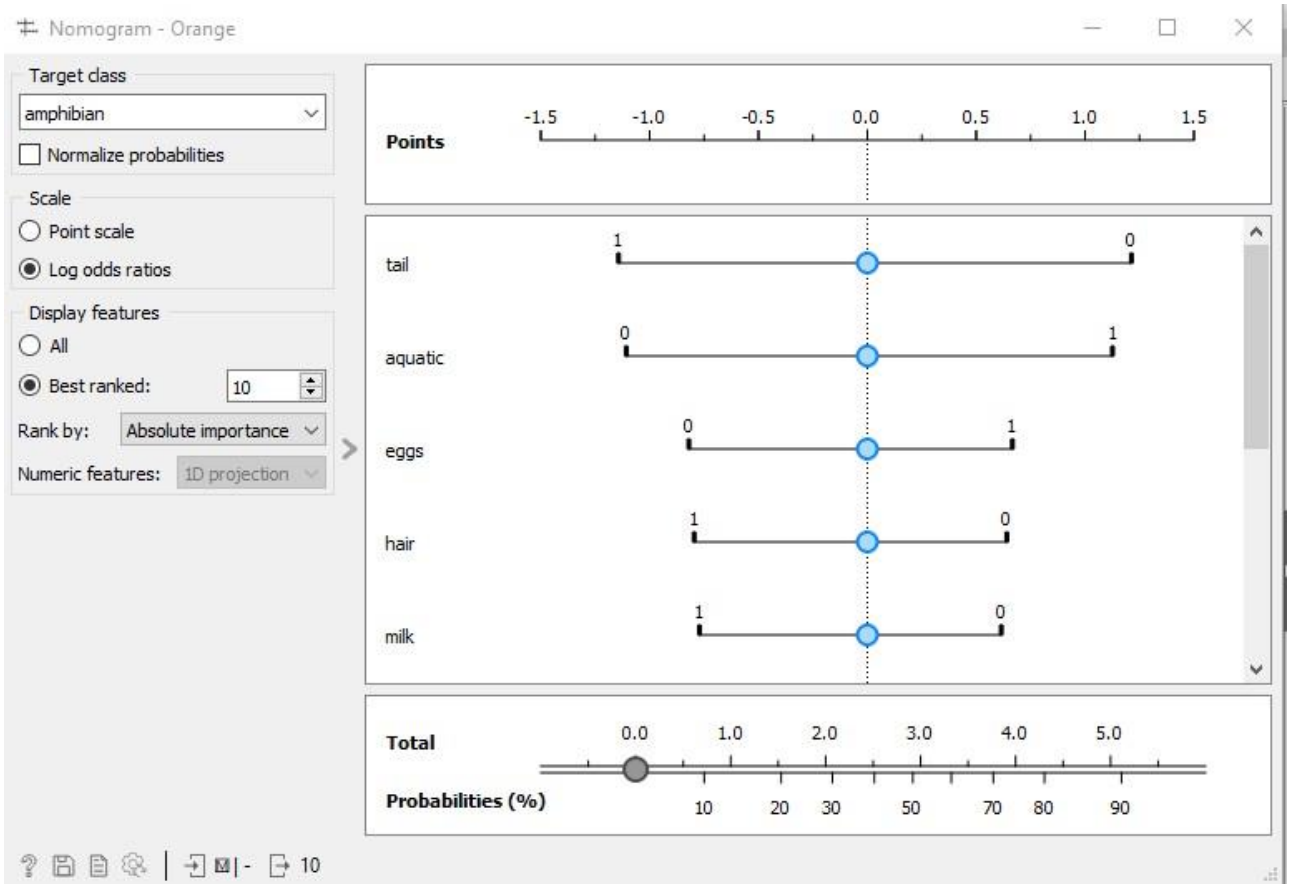

➢ A Nomogram is useful to view data from a Naive Bayes' model. Drag and drop this widget onto the workspace. It can be found in the Visualise section.

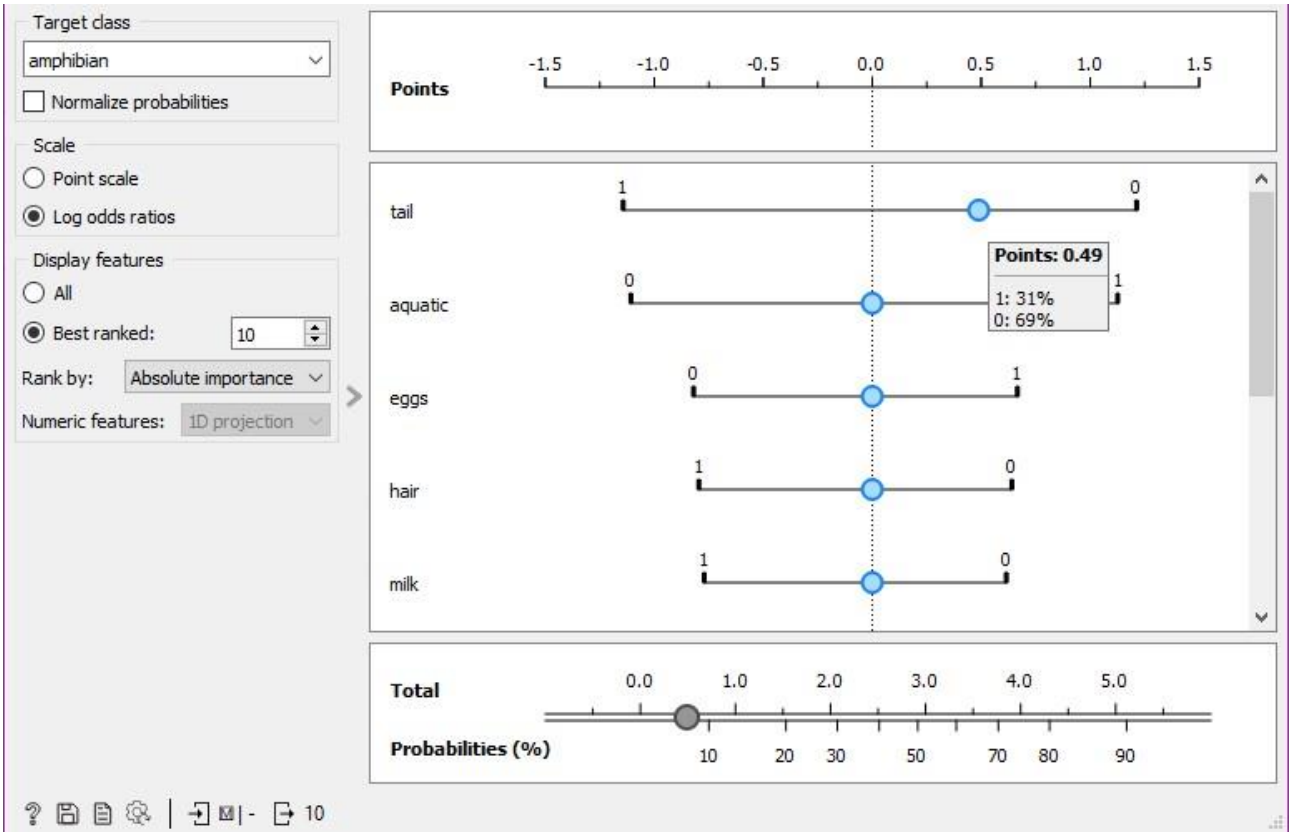

Visualize
This
Tree Viewer
Box Plot
Violin Plot
Distributions
Scatter Plot
Line Plot
Bar Plot
Sieve Diagram
Mosaic Display
FreeViz
Linear Projection
Radviz
Heat Map
Venn Diagram
Silhouette Plot
Pythagorean Tree
Pythagorean Forest
CN2 Rule Viewer
Nomogram



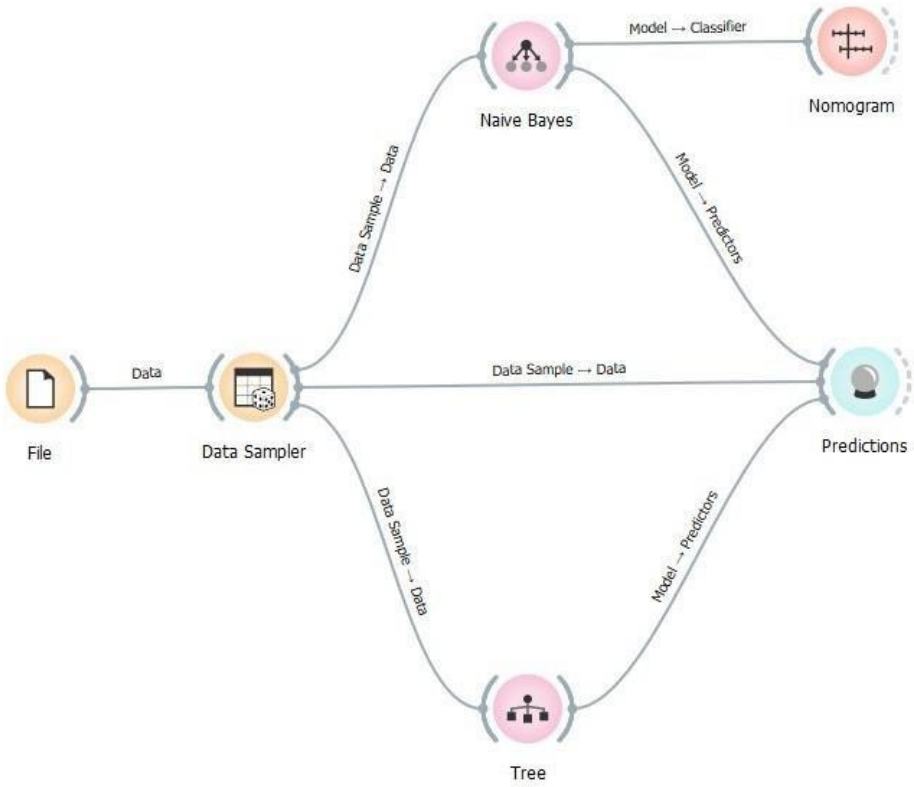

➢ You can move the points in the Nomogram to see the probabilities of a particular class. Here 1 indicates favourable probability while 0 indicates unfavourable probability.


Target class
amphibian
Normalize probabilities
Scale
Point scale
Log odds ratios
Display features
All
Best ranked: 10
Rank by: Absolute importance
Numeric features: 1D projection
You can move these
Points
tail
aquatic
eggs
hair
milk
venomous
legs
catsize
toothed
Total
Probabilities (%)

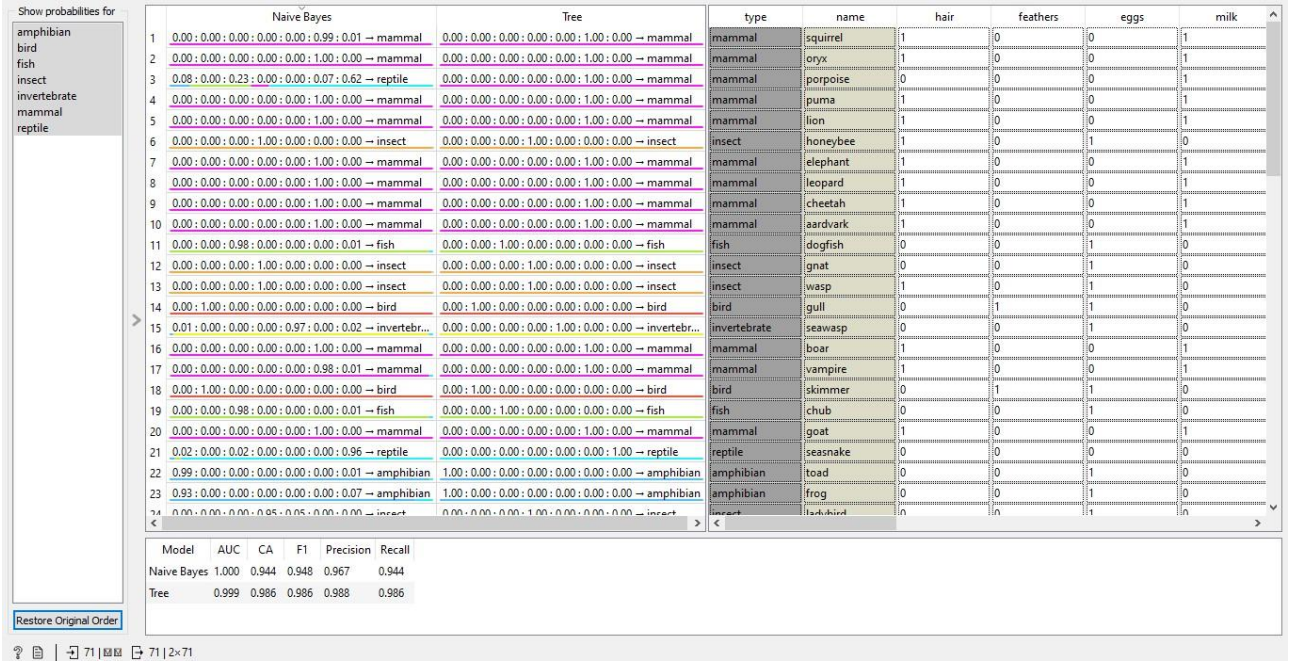

Nomogram - Orange
Target class
amphibian
Normalize probabilities
Scale
Point scale
Log odds ratios
Display features
All
Best ranked: 10
Rank by: Absolute importance
Numeric features: 1D projection
Points
tail
aquatic
eggs
hair
milk
Total
Probabilities (%)



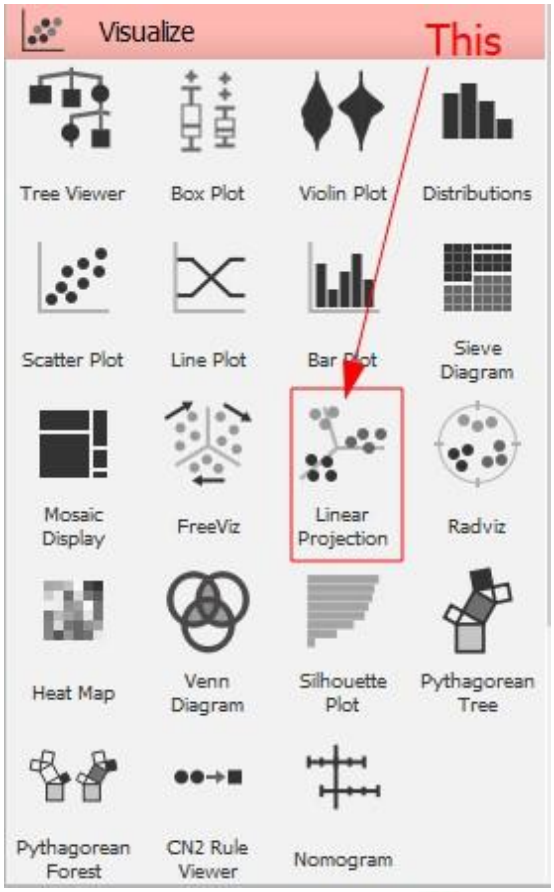

➢ Connect the Naive Bayes widget and Tree widget to the Predictions widget to perform predictions.

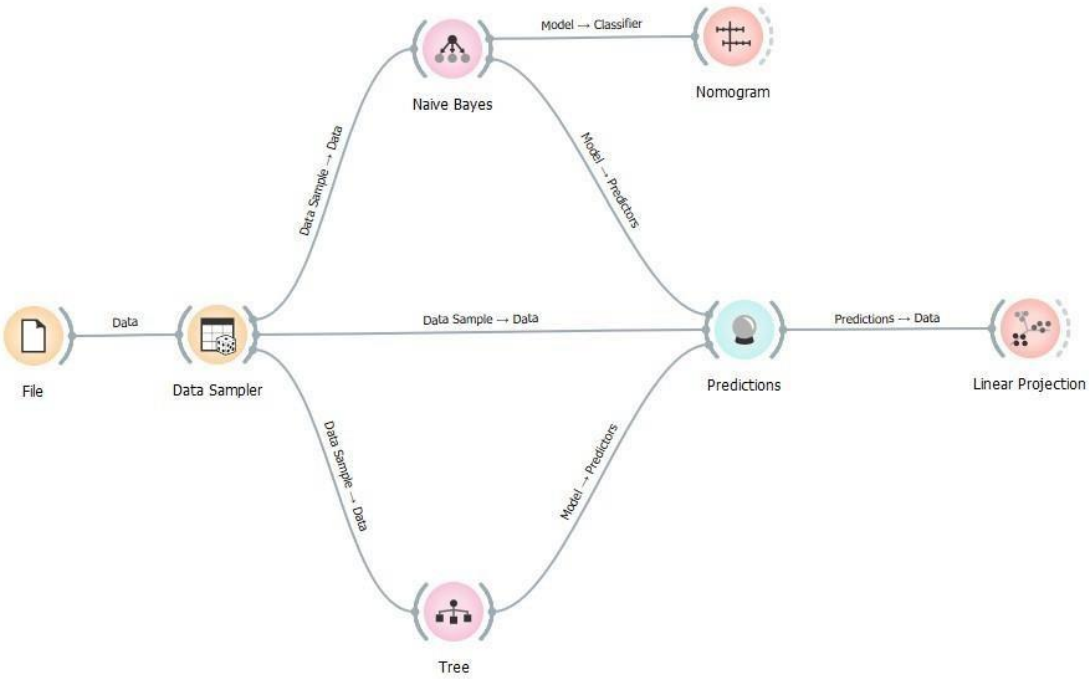


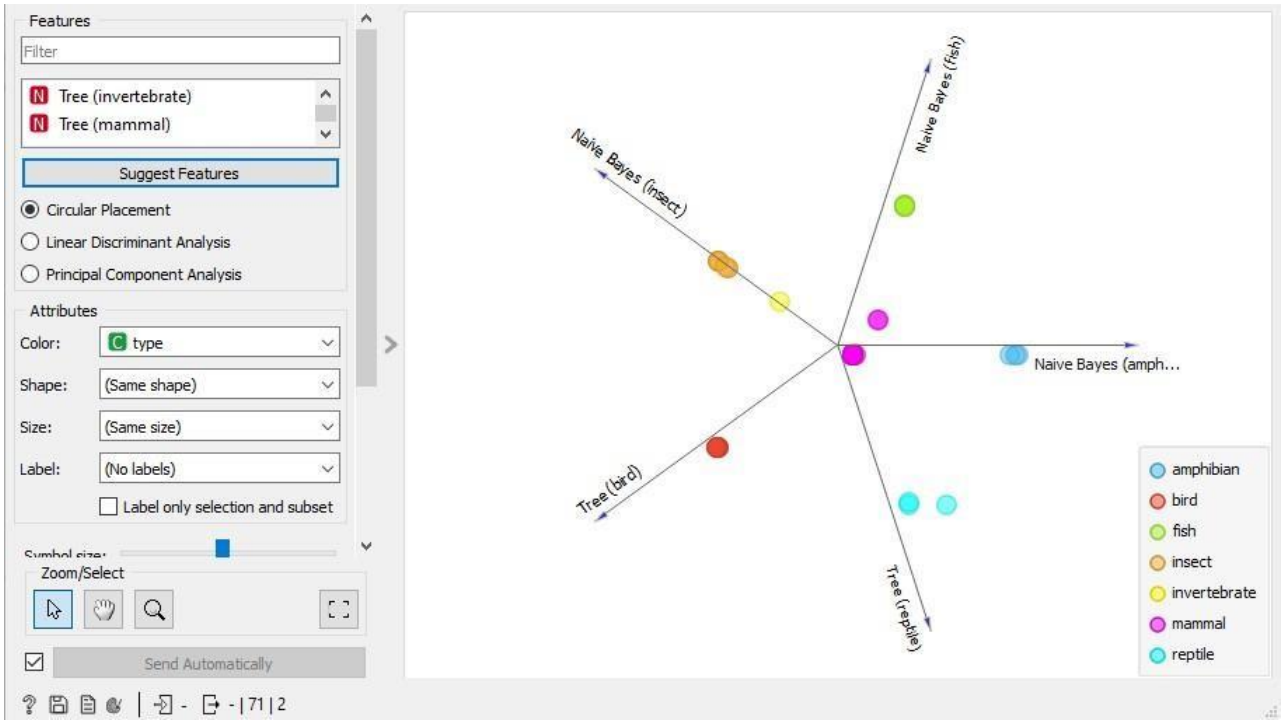

➢ Double click the Predictions widget to see the predictions.




➢ We will use the Linear Projection widget to visualize the data. Drag and drop this widget from the Visualize section.


Visualize
This
Tree Viewer
Box Plot
Violin Plot
Distributions
Scatter Plot
Line Plot
Bar Plot
Sieve Diagram
Mosaic Display
FreeViz
Linear Projection
Radviz
Heat Map
Venn Diagram
Silhouette Plot
Pythagorean Tree
Pythagorean Forest
CN2 Rule Viewer
Nomogram


Model → Classifier
Naive Bayes
Nomogram
Data Sample → Data
Model → Predictors
Data
Data Sample → Data
Predictions → Data
File
Data Sampler
Predictions
Linear Projection
Data Sample → Data
Model → Predictors
Tree

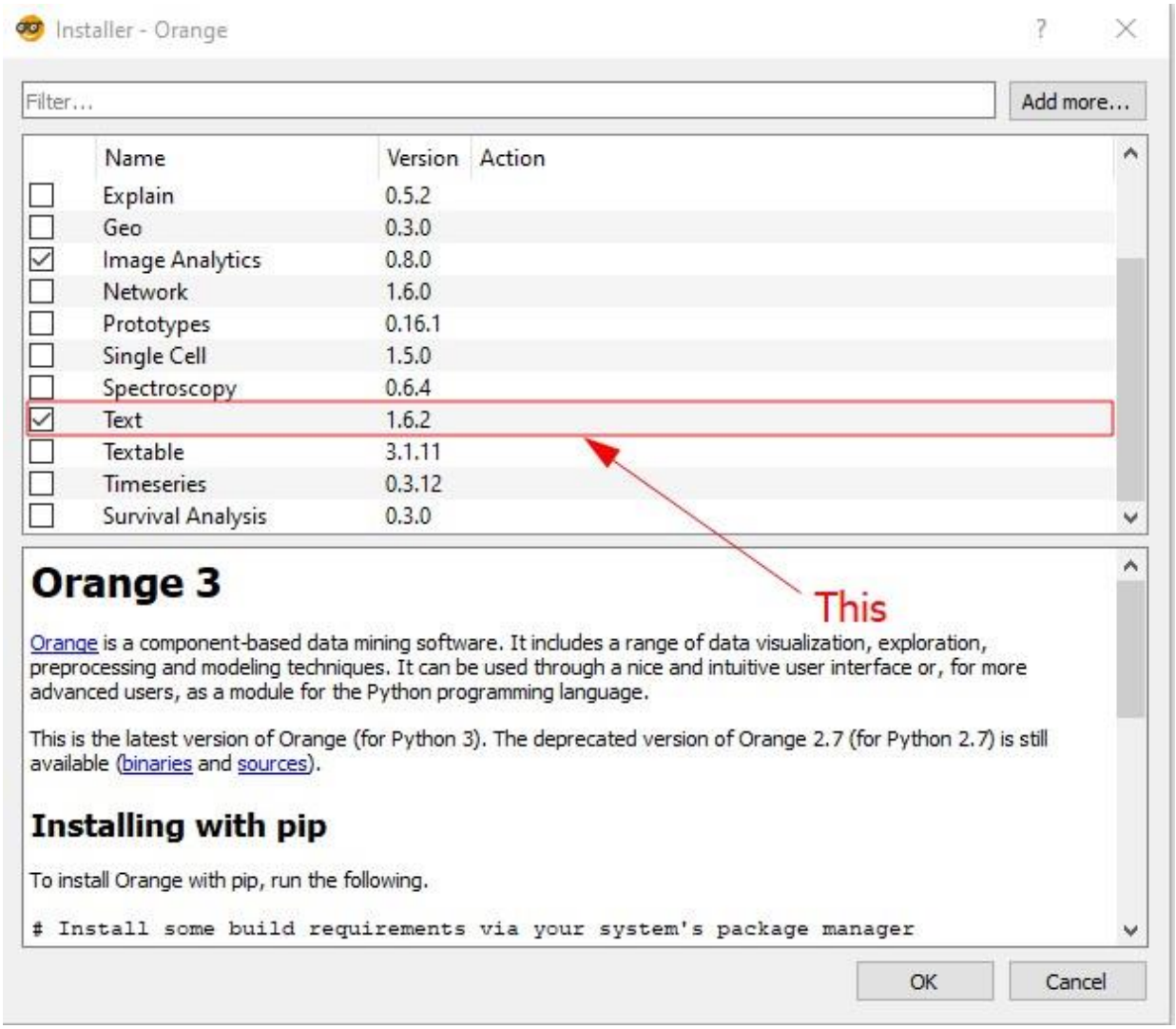



# Practical 2

**Aim:** Text classification using Orange.

**Steps**:

➢ Before starting, we need to install the `Text` add-on. Install it by navigating to Options > Add ons…. You will be prompted to restart Orange after the installation completes. If it is already installed, skip this step.

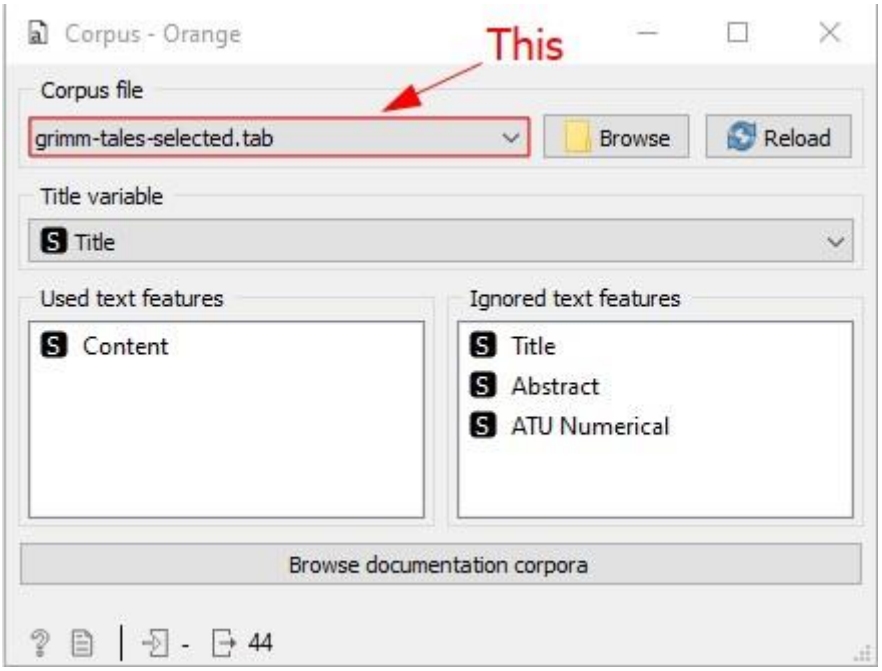



➢ Drag and drop a Corpus widget to the workspace. It can be found in the newly added Text Mining section.


Text Mining
This
Corpus
Import Documents
The Guardian
NY Times
Pubmed
Twitter
Preprocess Text
Corpus to Network
Bag of Words
Document Embedding
Similarity Hashing
Sentiment Analysis
Tweet Profiler
Topic Modelling
LDAvis
Corpus Viewer


Corpus

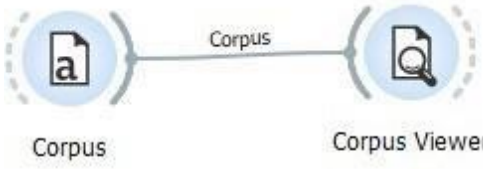
Double click the Corpus widget and select the grimm-tales-selected.tab corpus file.



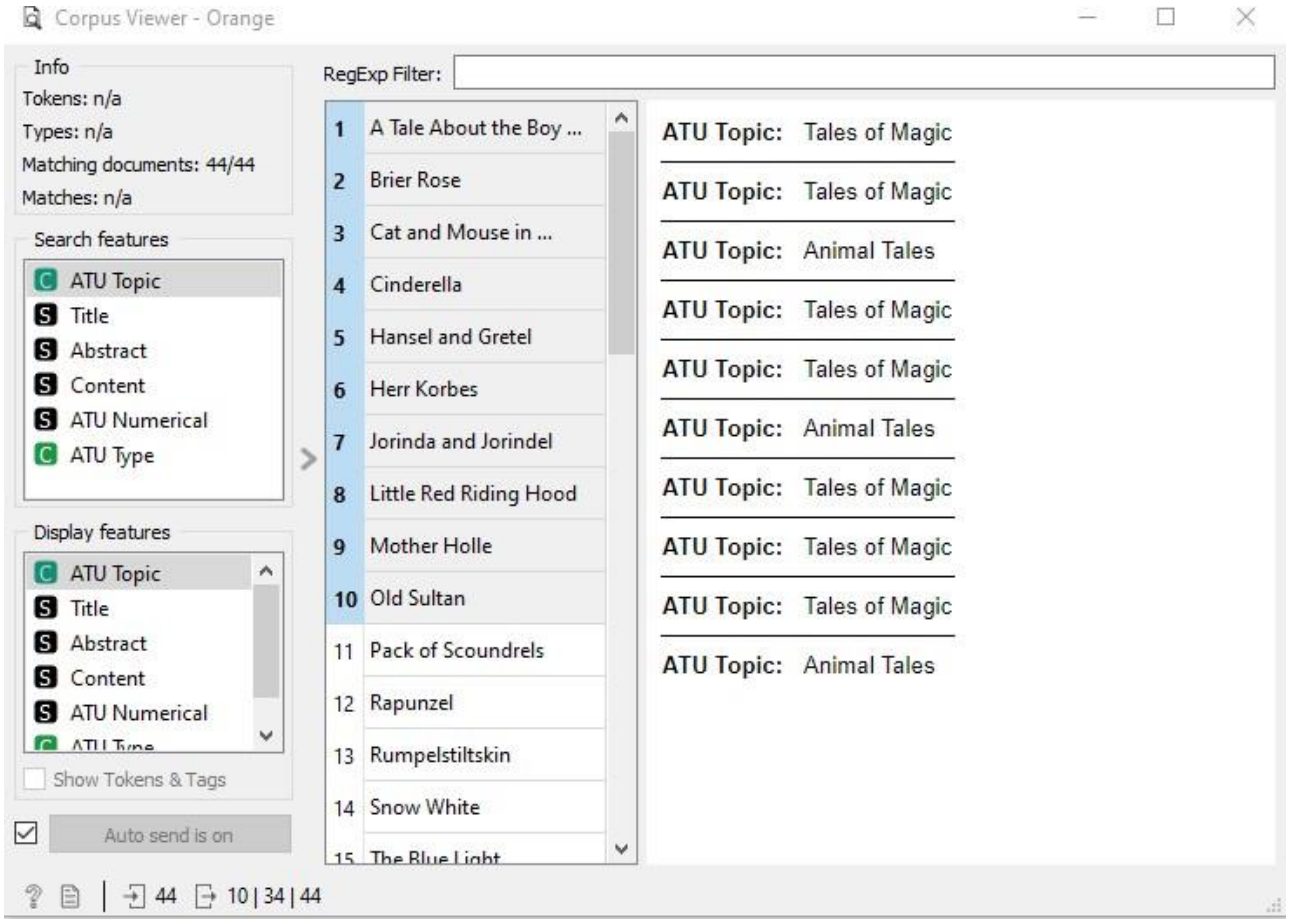

➢ Drag and drop a Corpus Viewer widget and connect it to the Corpus widget. The Corpus Viewer widget can be found in the Text Mining section.

➢


Pubmed
Twitter
Preprocess Text
Corpus to Network
Bag of Words
Document Embedding
Similarity Hashing
Sentiment Analysis
Tweet Profiler
Topic Modelling
LDAvis
Corpus Viewer
Score Documents
Word Cloud
Concordance
Document Map
Word Enrichment
Duplicate Detection
Word List
Extract Keywords
Semantic Viewer
Statistics
This

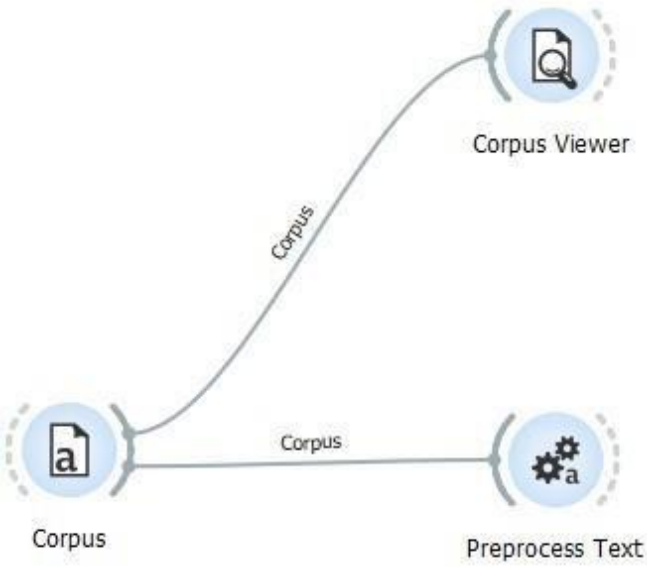

Corpus
Corpus
Corpus Viewer

Double click the Corpus Viewer widget to visualize the corpus in a tabular format. Select the first 10 entries to use as training set.



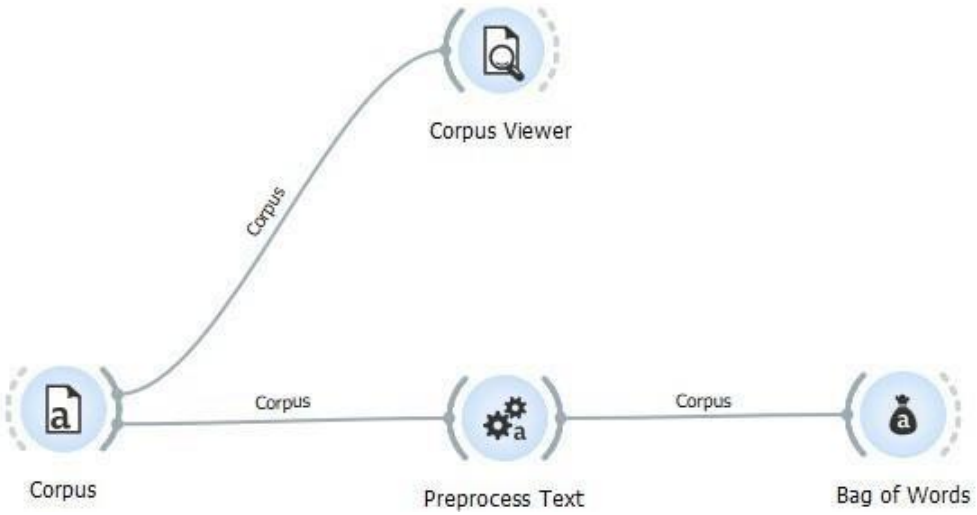

➢ Add a Preprocess Text widget to the workspace. This widget can also be found in the Text Mining section.

➢

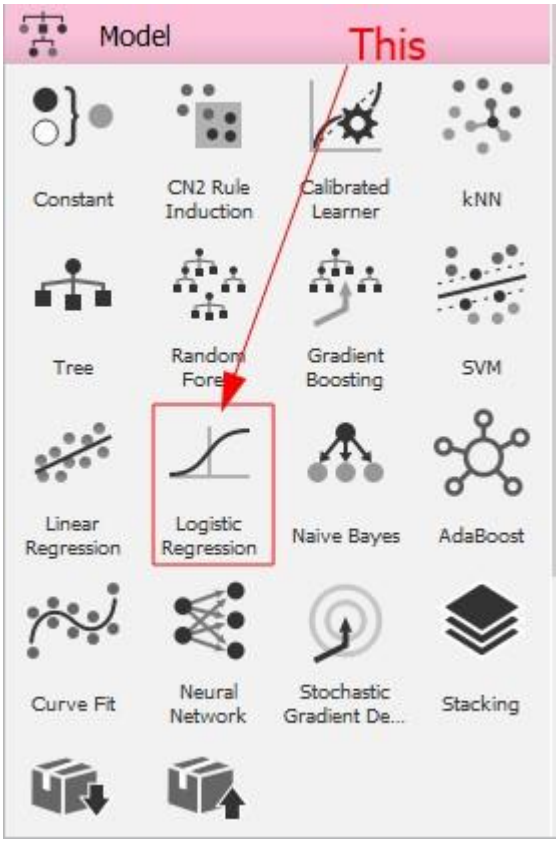

Add a Bag Of Words widget to the workspace and connect it to the Preprocess Text widget. This widget is also found in the Text Mining section.


Text Mining
This
Corpus
Import Documents
The Guardian
NY Times
Pubmed
Twitter
Preprocess Text
Corpus to Network
Bag of Words
Document Embedding
Similarity Hashing
Sentiment Analysis
Tweet Profiler
Topic Modelling
LDAvis
Corpus Viewer
Score Documents
Word Cloud
Concordance
Document Map

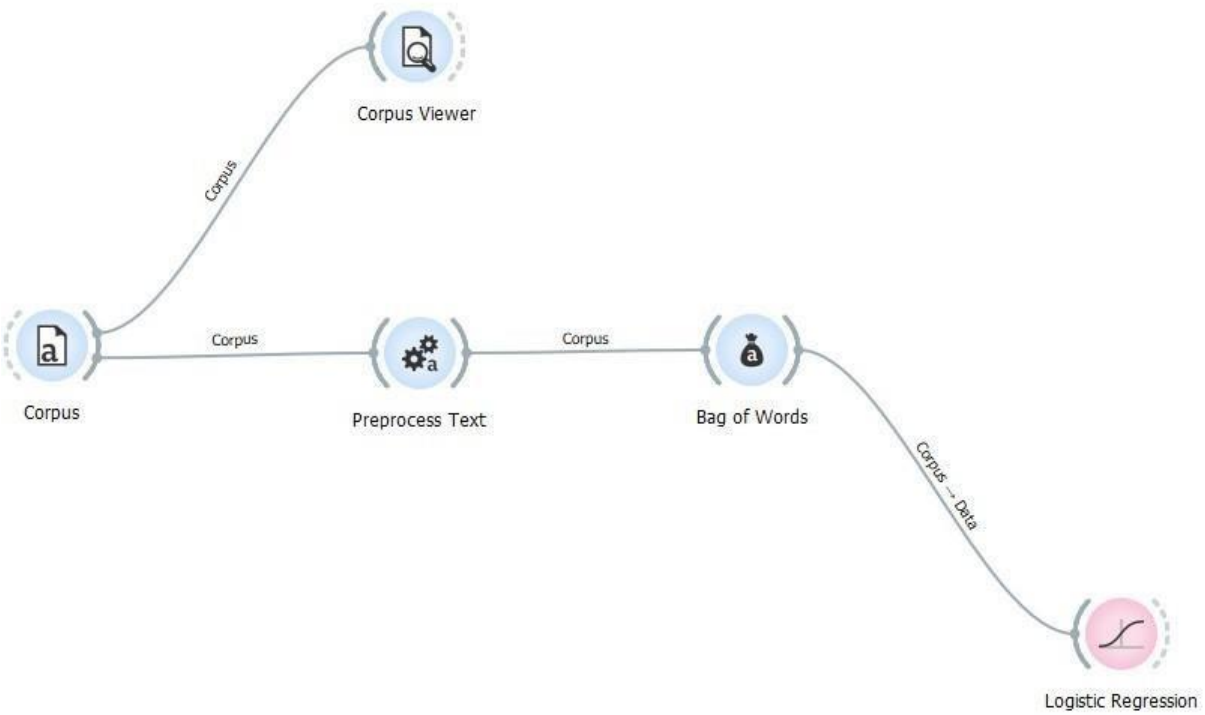

Corpus Viewer
Corpus
Corpus
Corpus
Corpus
Preprocess Text
Bag of Words

➢

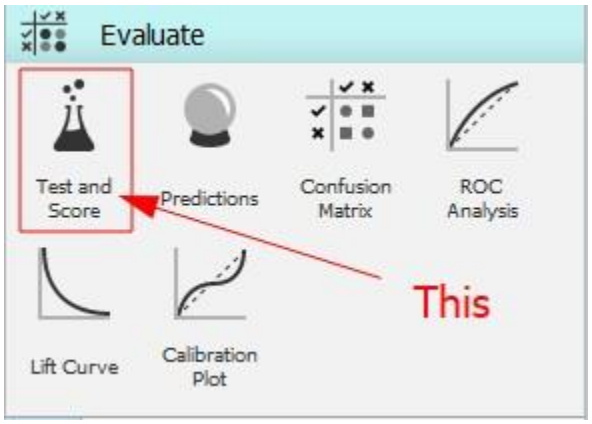
We will use Logistic Regression to model our data. Drag and drop this widget from the Model section onto the workspace.



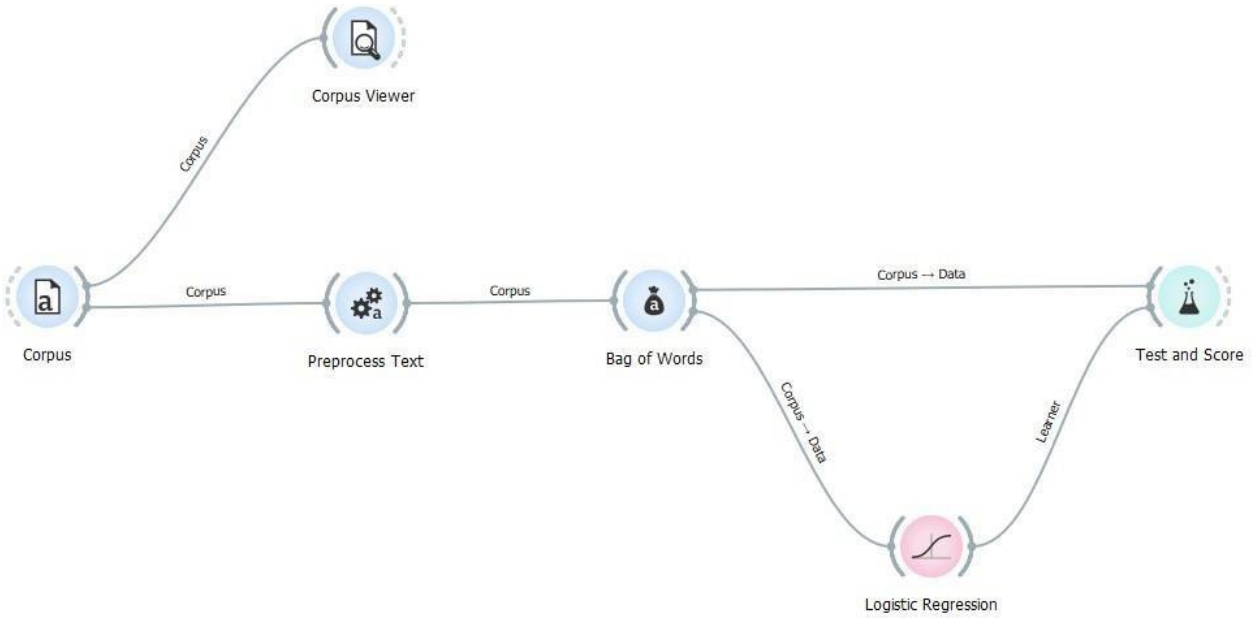
➢



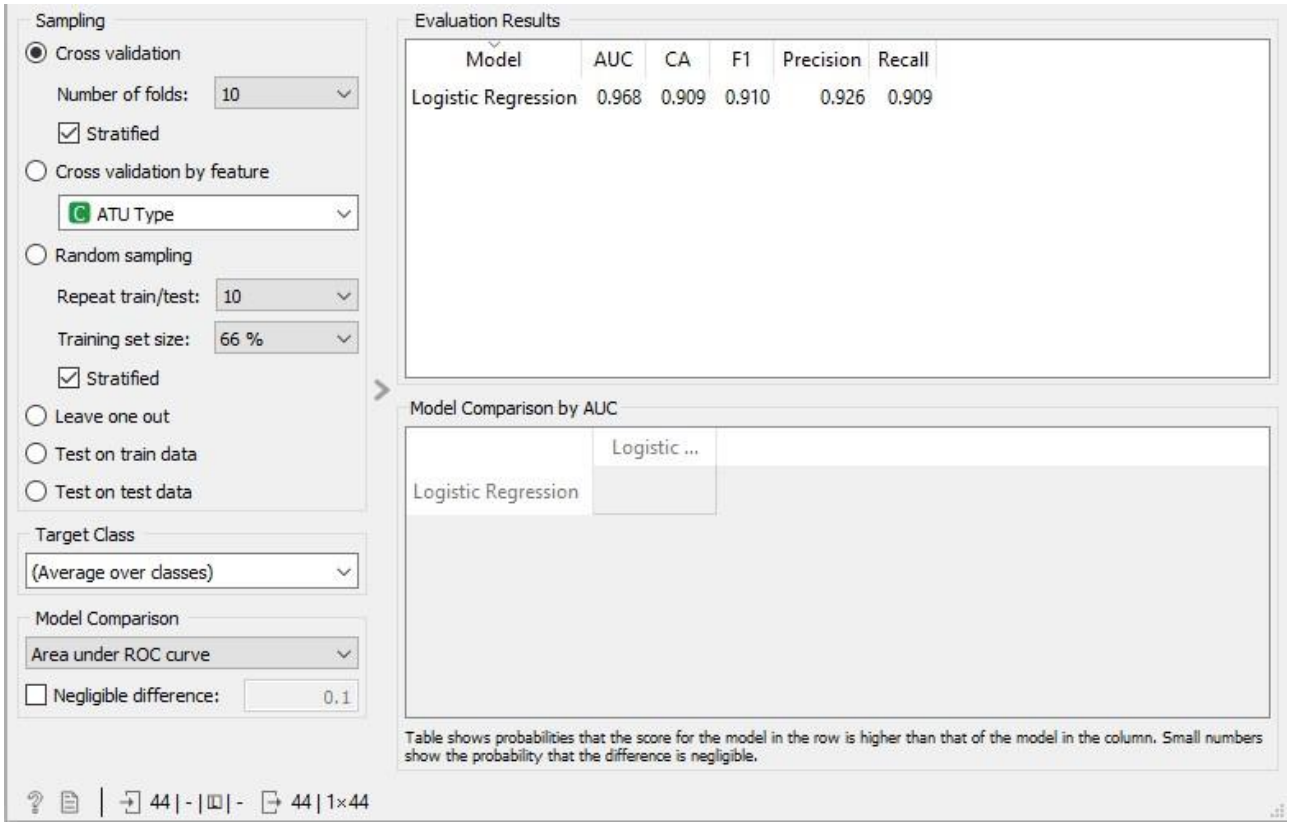

We will use the Test and Score widget to check our model. Drag and drop this widget from the Evaluate section onto the workspace and connect it to the Logistic Regression model and Bag of Words widget.



➢

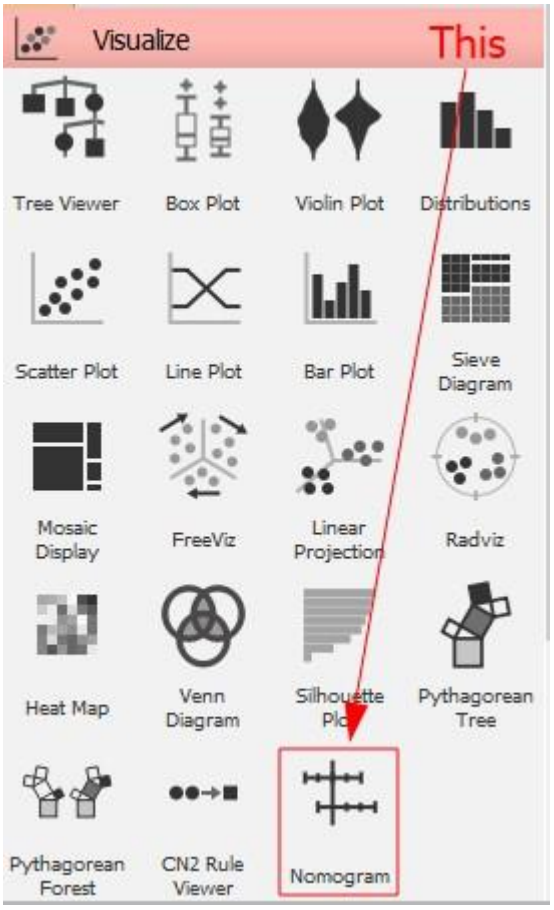


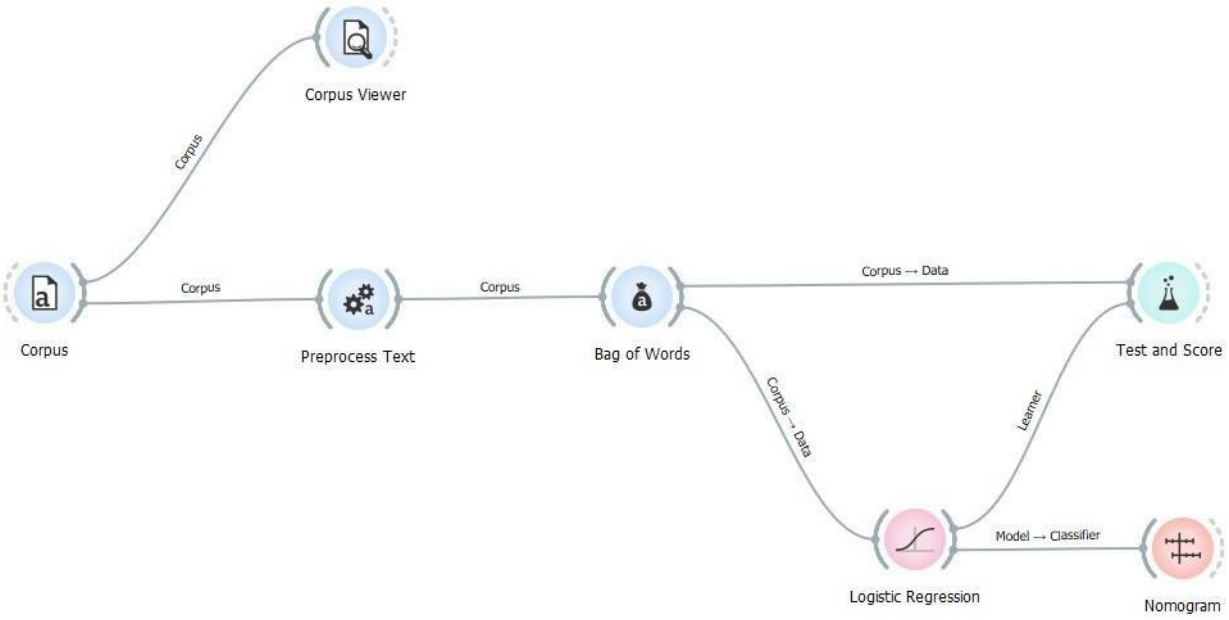

Double-click the Test and Score widget after it finishes processing. It will provide you with data such as the accuracy of the model etc.

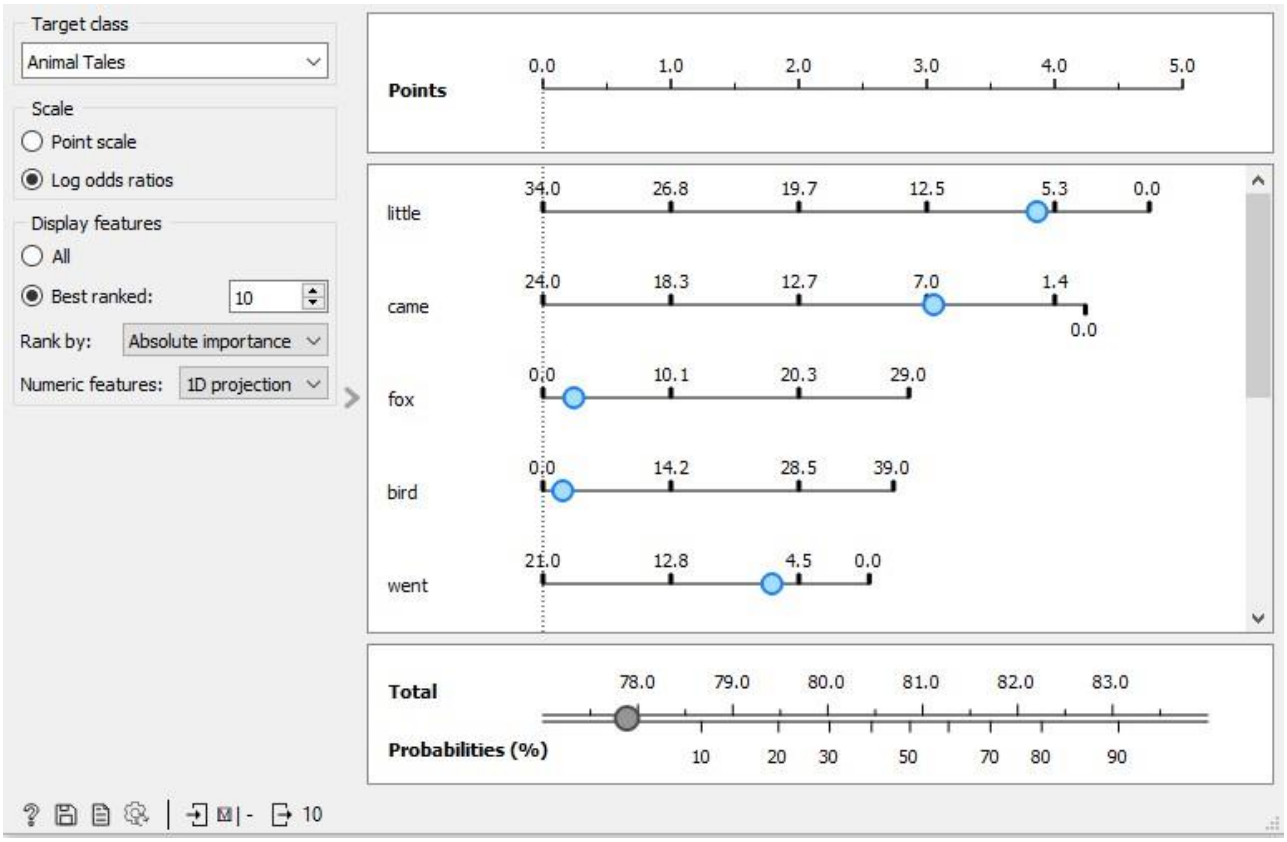


➢

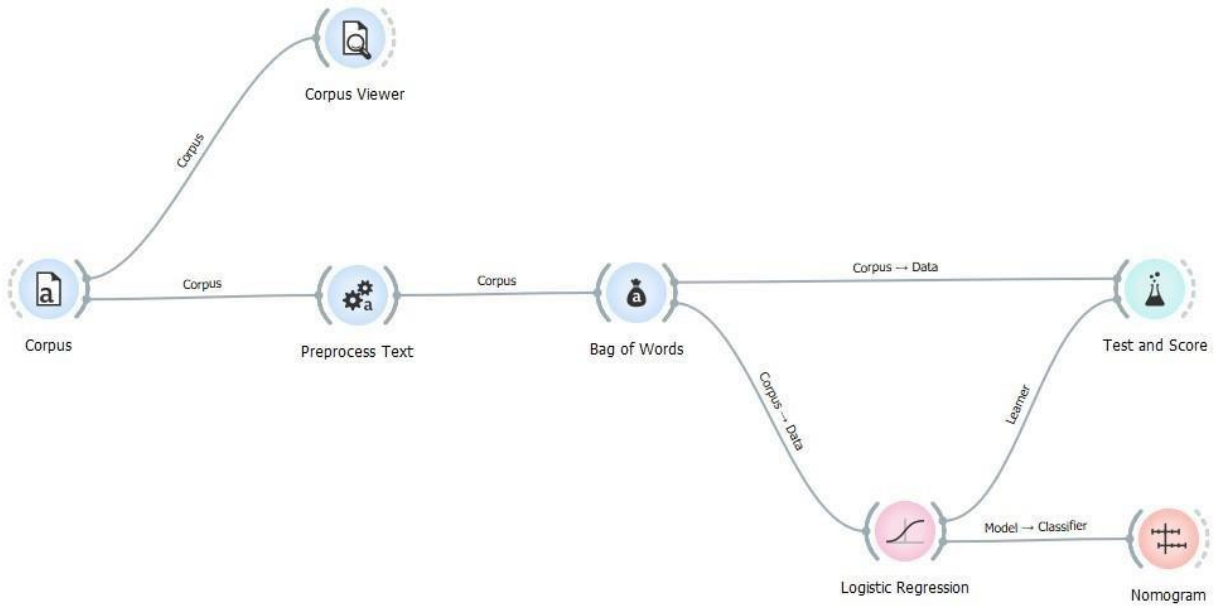
➢ We will use a Nomogram to visualize our model. Drag and drop it from the Visualize section onto the workspace and connect it to the Linear Regression model.


Visualize
This
Tree Viewer
Box Plot
Violin Plot
Distributions
Scatter Plot
Line Plot
Bar Plot
Sieve Diagram
Mosaic Display
FreeViz
Linear Projection
Radviz
Heat Map
Venn Diagram
Silhouette Plot
Pythagorean Tree
Pythagorean Forest
CN2 Rule Viewer
Nomogram

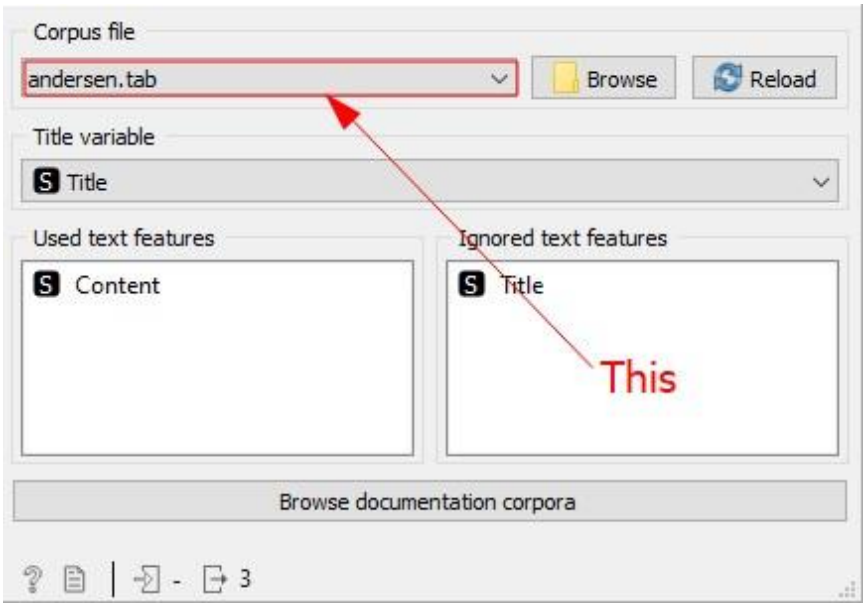

Corpus Viewer
Corpus
Corpus
Corpus
Corpus
Preprocess Text
Bag of Words
Corpus → Data
Test and Score
Corpus → Data
Learner
Model → Classifier
Logistic Regression
Nomogram



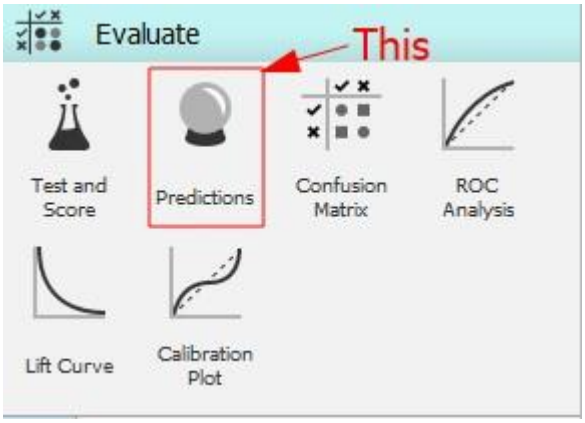

➢ To see whether the model works as intended, we create a new Corpus widget and set the file to andersen.tab.

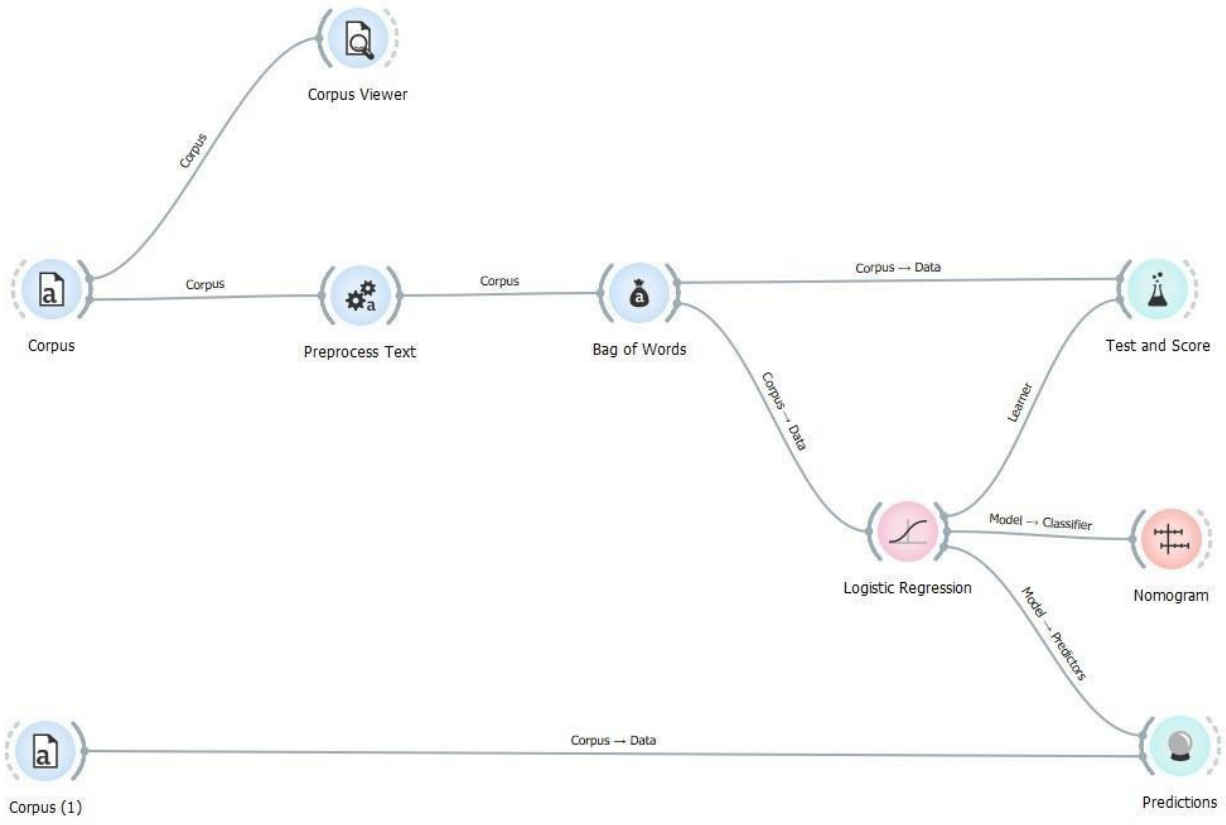


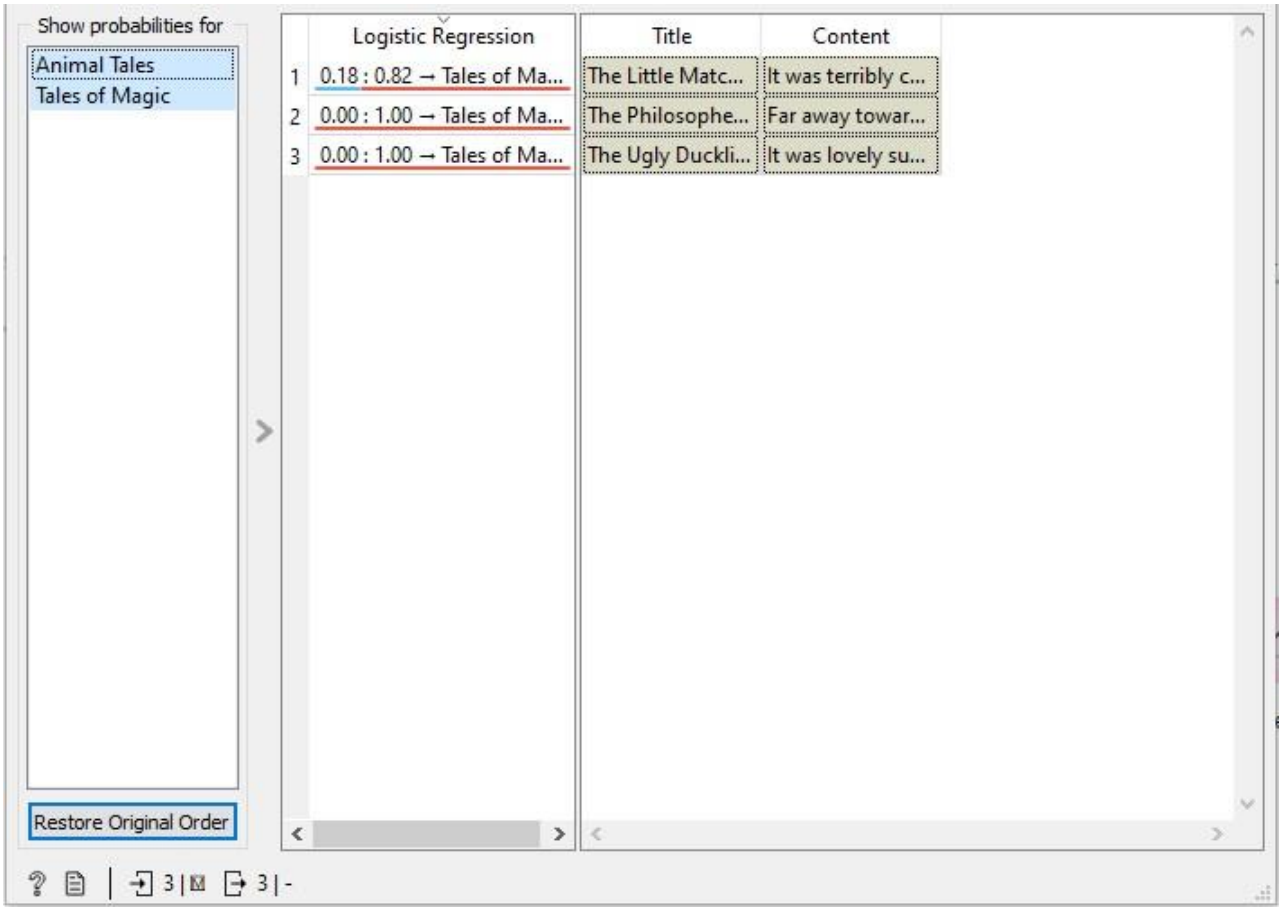





➢ Now drag and drop a Predictions widget from the Evaluate section onto the workspace. Connect it to the model as well as the new Corpus widget to visualise the results.


Evaluate
This
Test and Score
Predictions
Confusion Matrix
ROC Analysis
Lift Curve
Calibration Plot


Corpus Viewer
Corpus
Corpus
Corpus
Preprocess Text
Corpus
Bag of Words
Corpus → Data
Test and Score
Corpus → Data
Learner
Model → Classifier
Logistic Regression
Nomogram
Model → Predictors
Corpus (1)
Corpus → Data
Predictions

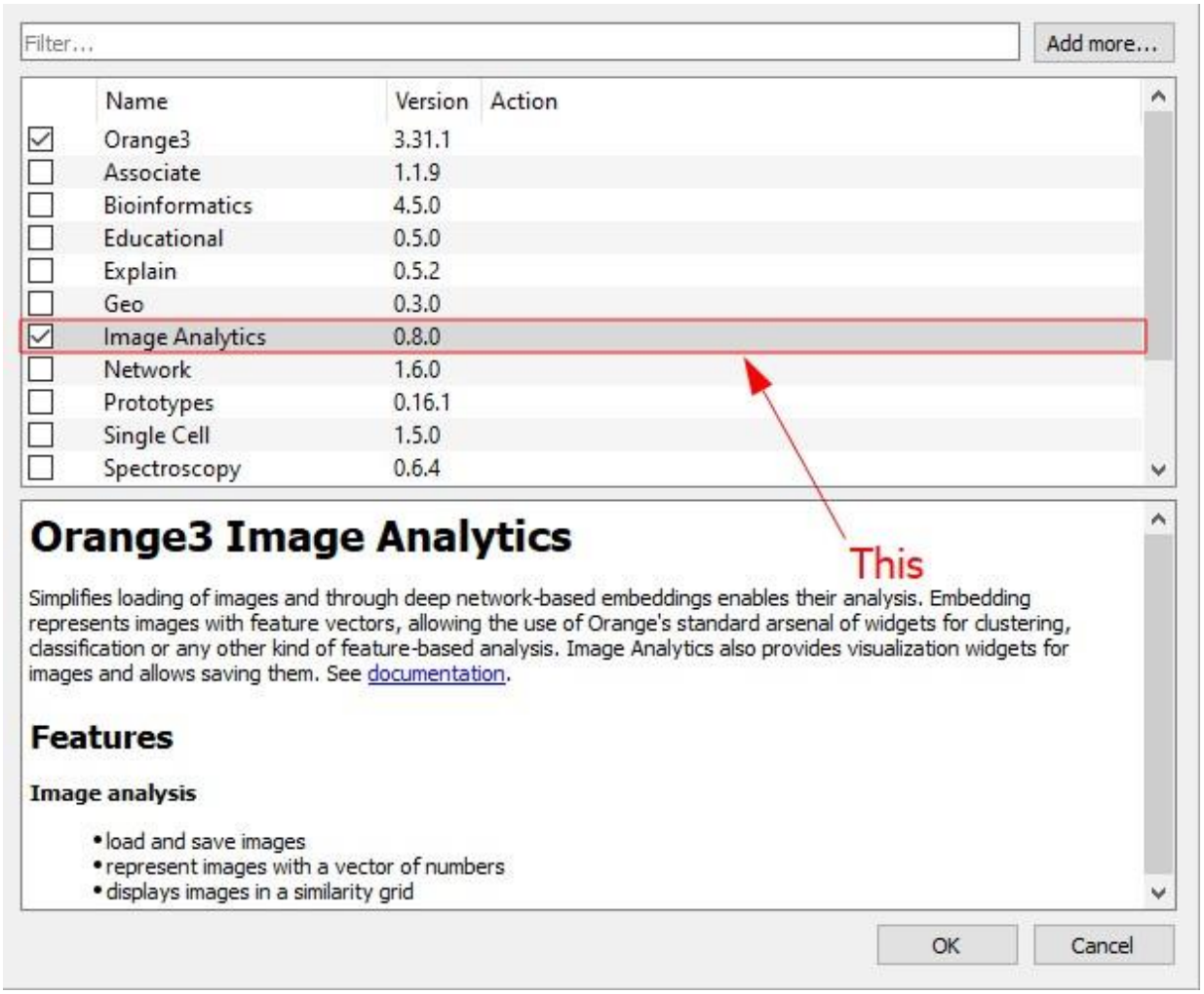

Show probabilities for
Animal Tales
Tales of Magic
Restore Original Order
Logistic Regression
1 0.18 : 0.82 → Tales of Ma...
2 0.00 : 1.00 → Tales of Ma...
3 0.00 : 1.00 → Tales of Ma...
Title
Content
The Little Matc...
It was terribly c...
The Philosophe...
Far away towar...
The Ugly Duckli...
It was lovely su...
3
3

# Practical 3

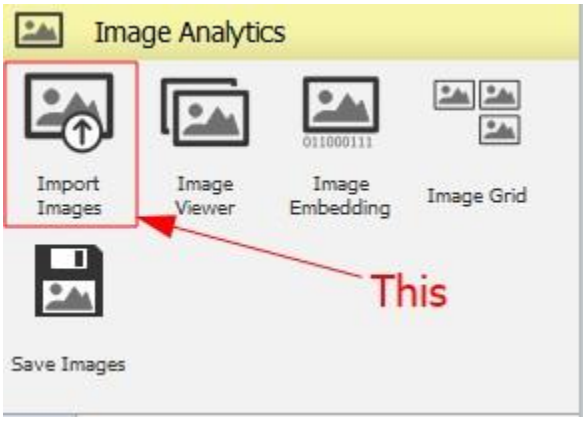
**Aim:** Image classification using orange.

**Steps:**

➢ Before starting, we need to install the `ImageProcessing` add-on. Install it by navigating to Options > Add ons…. You will be prompted to restart Orange after the installation completes. If it is already installed, skip this step.

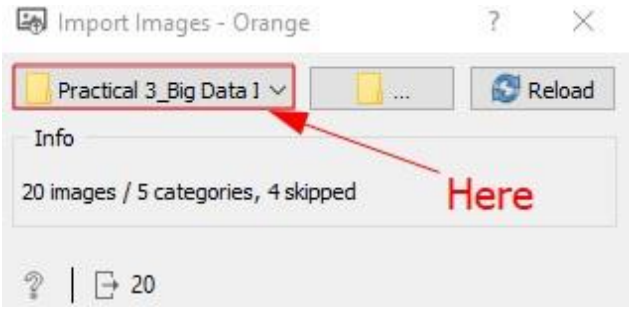



➢ Add a Import Images widget from the newly added Image Analytics section to the workspace.





➢ Load the directory containing the images in the newly added Import




Images widget by double clicking the widget.

➢ We can view these images using the Image Viewer widget found in the Image Analytics section. Drag and drop this widget onto the workspace and connect it to the Import Images widget.

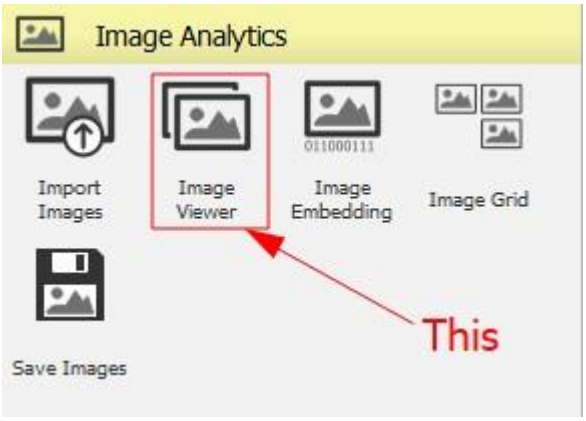


Image Analytics
Import Images
Image Viewer
Image Embedding
Image Grid
Save Images
This

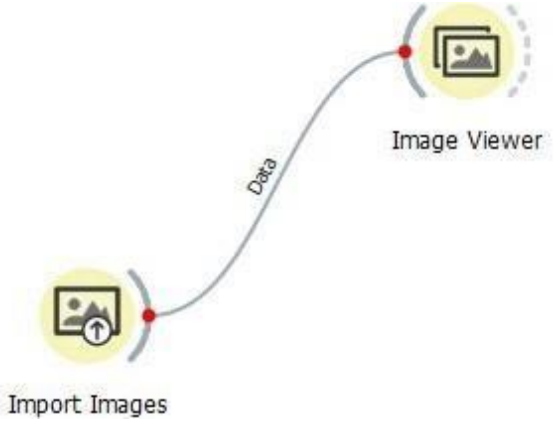
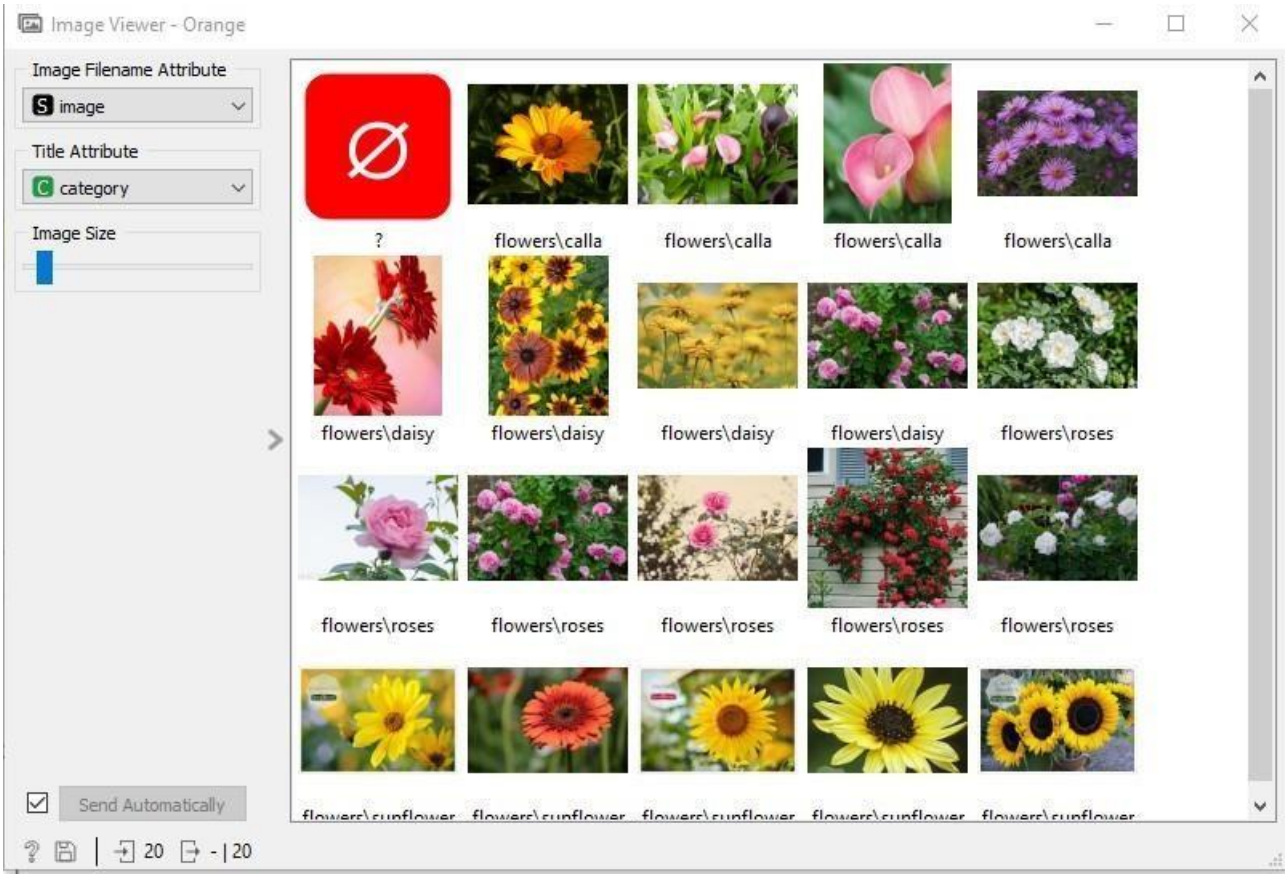
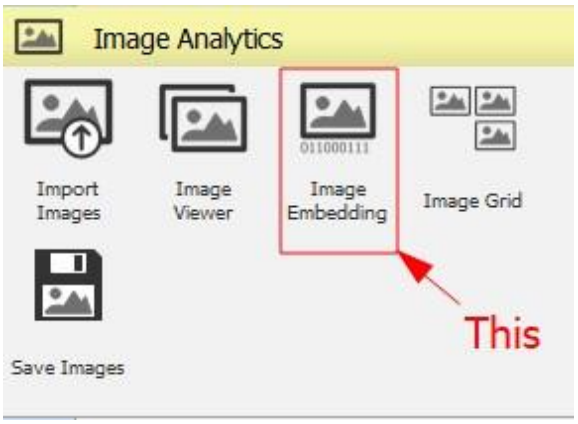
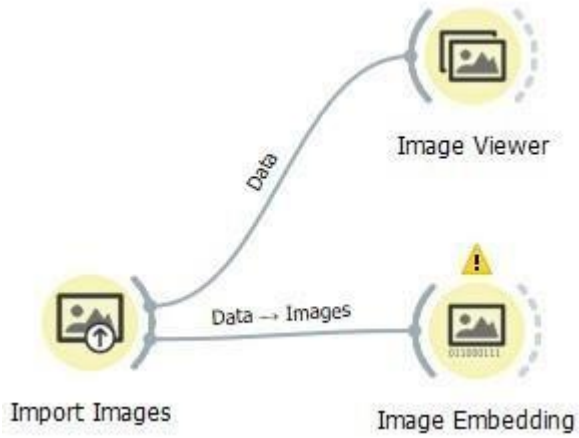


Image Viewer
Data
Import Images

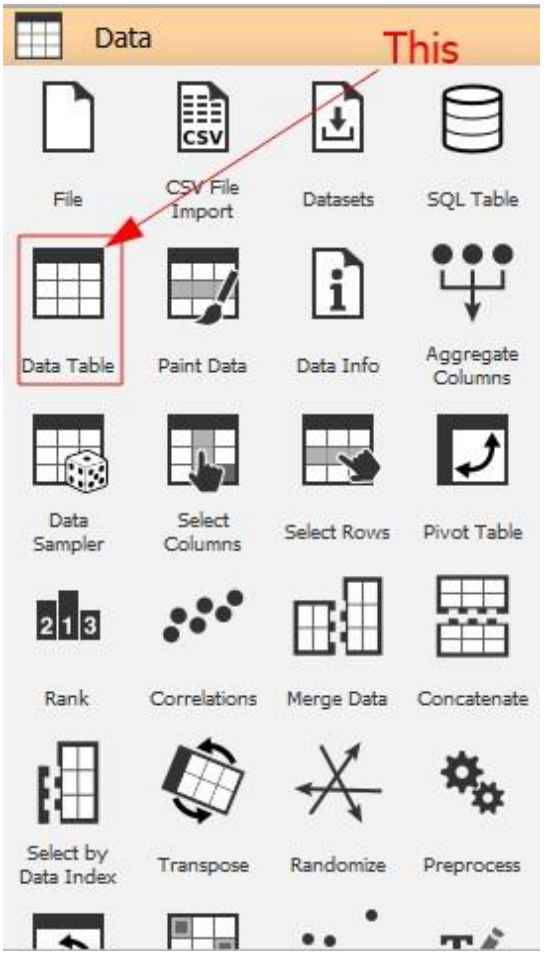



➢ As our models can only process numbers, we need to convert the images into numerical data. This is where Image Embedding comes into play. Drag and drop a Image Embedding widget from the Image Analytics section onto the workspace and connect it to the Import Images widget.






➢ We use a Data Table to visualise the tabular data generated by the Image Embedding widget. Drag and drop a Data Table widget from the Data section onto the workspace and connect it to the Image Embedding widget.


Data
This
File
CSV File Import
Datasets
SQL Table
Data Table
Paint Data
Data Info
Aggregate Columns
Data Sampler
Select Columns
Select Rows
Pivot Table
Rank
Correlations
Merge Data
Concatenate
Select by Data Index
Transpose
Randomize
Preprocess

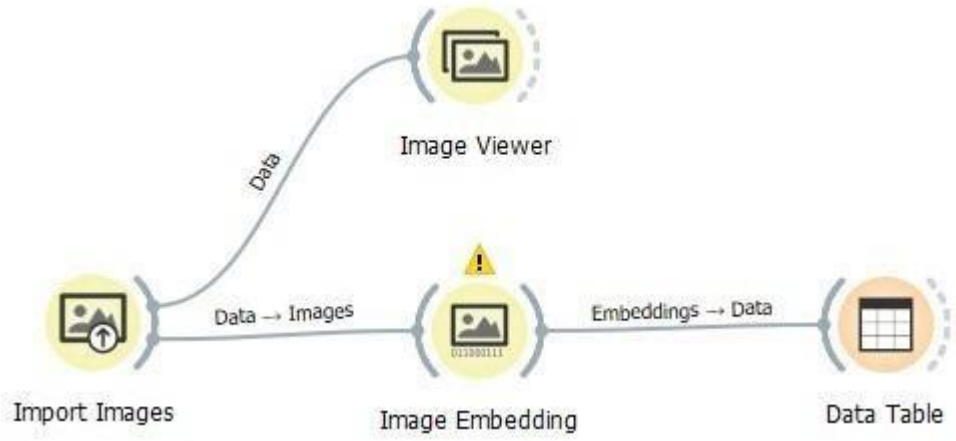
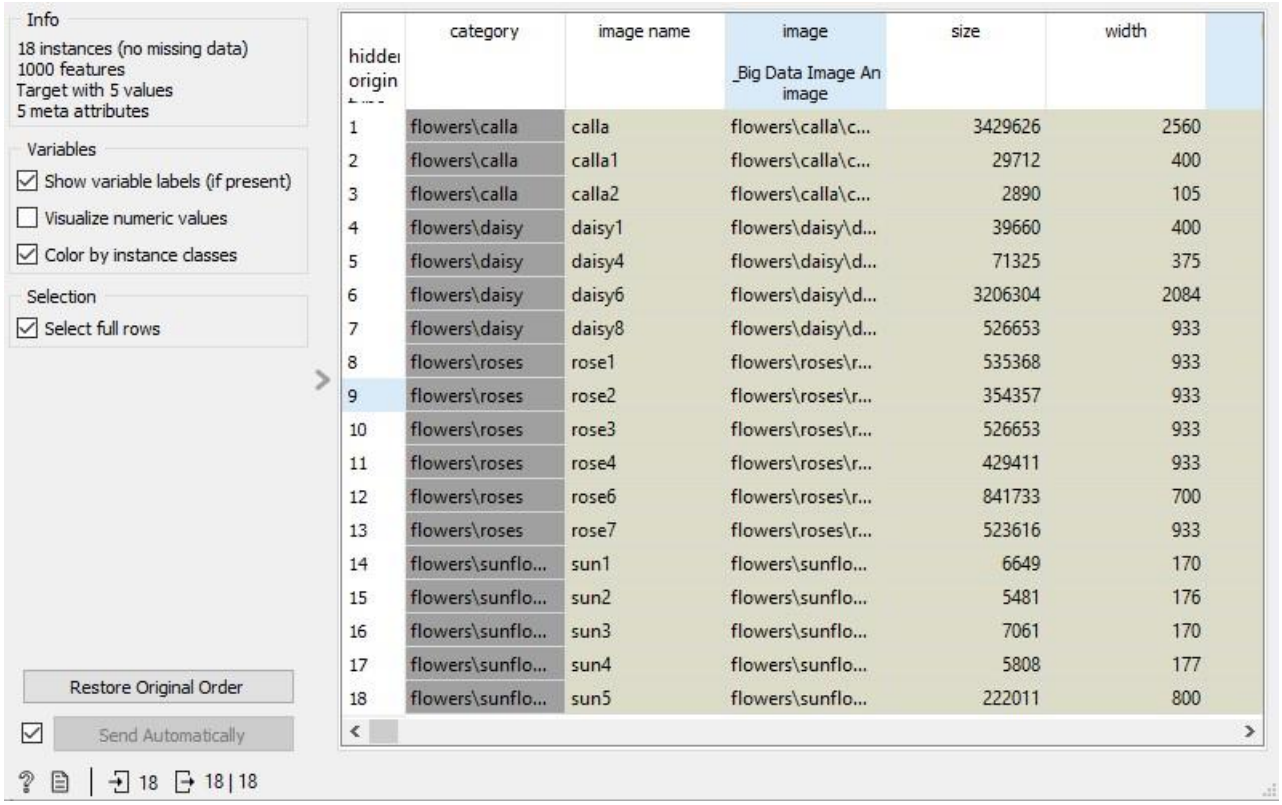
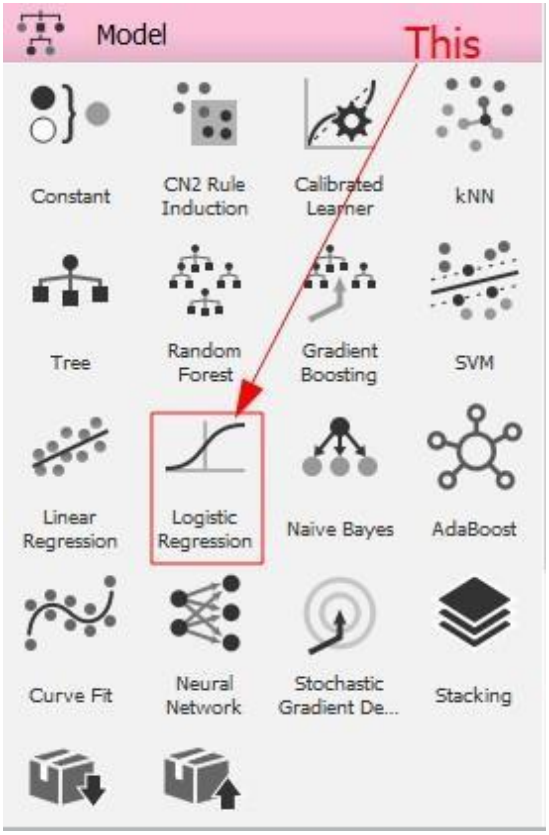


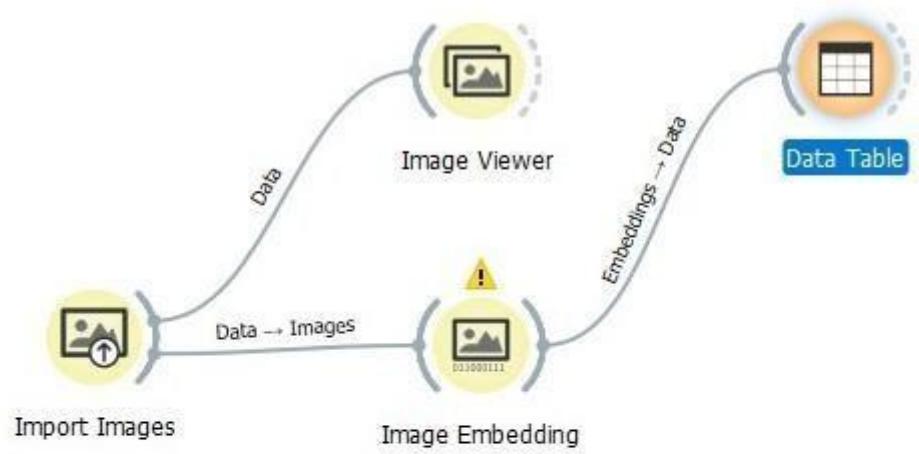
Image Viewer
Data
Data → Images
Embeddings → Data
Import Images
Image Embedding
Data Table




| hidden origin | category | image name | image _Big Data Image An image | size | width |
|---|---|---|---|---|---|
| 1 | flowers\calla | calla | flowers\calla\c... | 3429626 | 2560 |
| 2 | flowers\calla | calla1 | flowers\calla\c... | 29712 | 400 |
| 3 | flowers\calla | calla2 | flowers\calla\c... | 2890 | 105 |
| 4 | flowers\daisy | daisy1 | flowers\daisy\d... | 39660 | 400 |
| 5 | flowers\daisy | daisy4 | flowers\daisy\d... | 71325 | 375 |
| 6 | flowers\daisy | daisy6 | flowers\daisy\d... | 3206304 | 2084 |
| 7 | flowers\daisy | daisy8 | flowers\daisy\d... | 526653 | 933 |
| 8 | flowers\roses | rose1 | flowers\roses\r... | 535368 | 933 |
| 9 | flowers\roses | rose2 | flowers\roses\r... | 354357 | 933 |
| 10 | flowers\roses | rose3 | flowers\roses\r... | 526653 | 933 |
| 11 | flowers\roses | rose4 | flowers\roses\r... | 429411 | 933 |
| 12 | flowers\roses | rose6 | flowers\roses\r... | 841733 | 700 |
| 13 | flowers\roses | rose7 | flowers\roses\r... | 523616 | 933 |
| 14 | flowers\sunflo... | sun1 | flowers\sunflo... | 6649 | 170 |
| 15 | flowers\sunflo... | sun2 | flowers\sunflo... | 5481 | 176 |
| 16 | flowers\sunflo... | sun3 | flowers\sunflo... | 7061 | 170 |
| 17 | flowers\sunflo... | sun4 | flowers\sunflo... | 5808 | 177 |
| 18 | flowers\sunflo... | sun5 | flowers\sunflo... | 222011 | 800 |

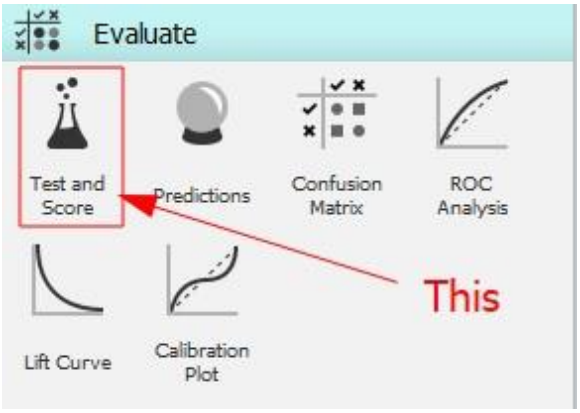
➢ We will use Logistic Regression as our model. Drag and drop a Logistic Regression widget from the Model section onto the workspace.







➢ Drag and drop a Test and Score widget from the Evaluate section onto the workspace. This widget will allow us to verify our model. Connect this widget to the Image Embedding and Logistic Regression widgets.



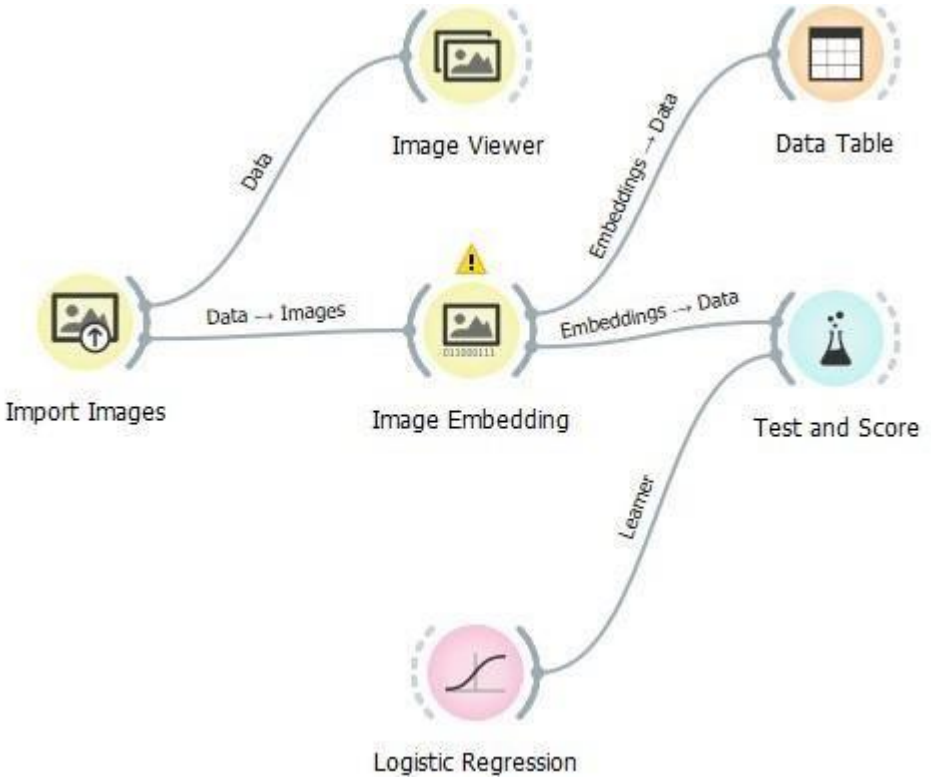
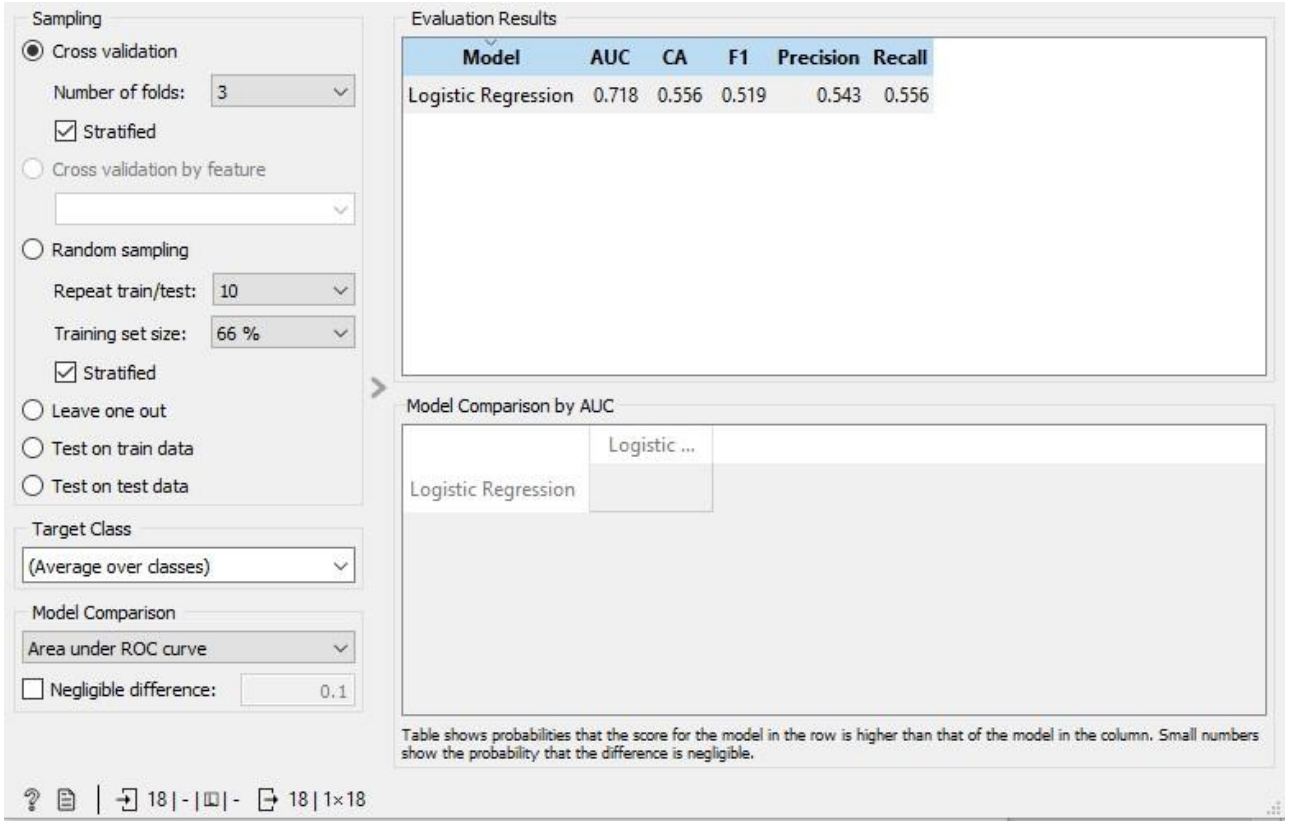
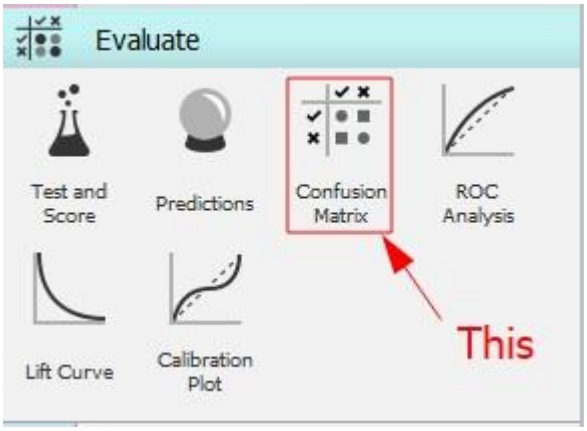
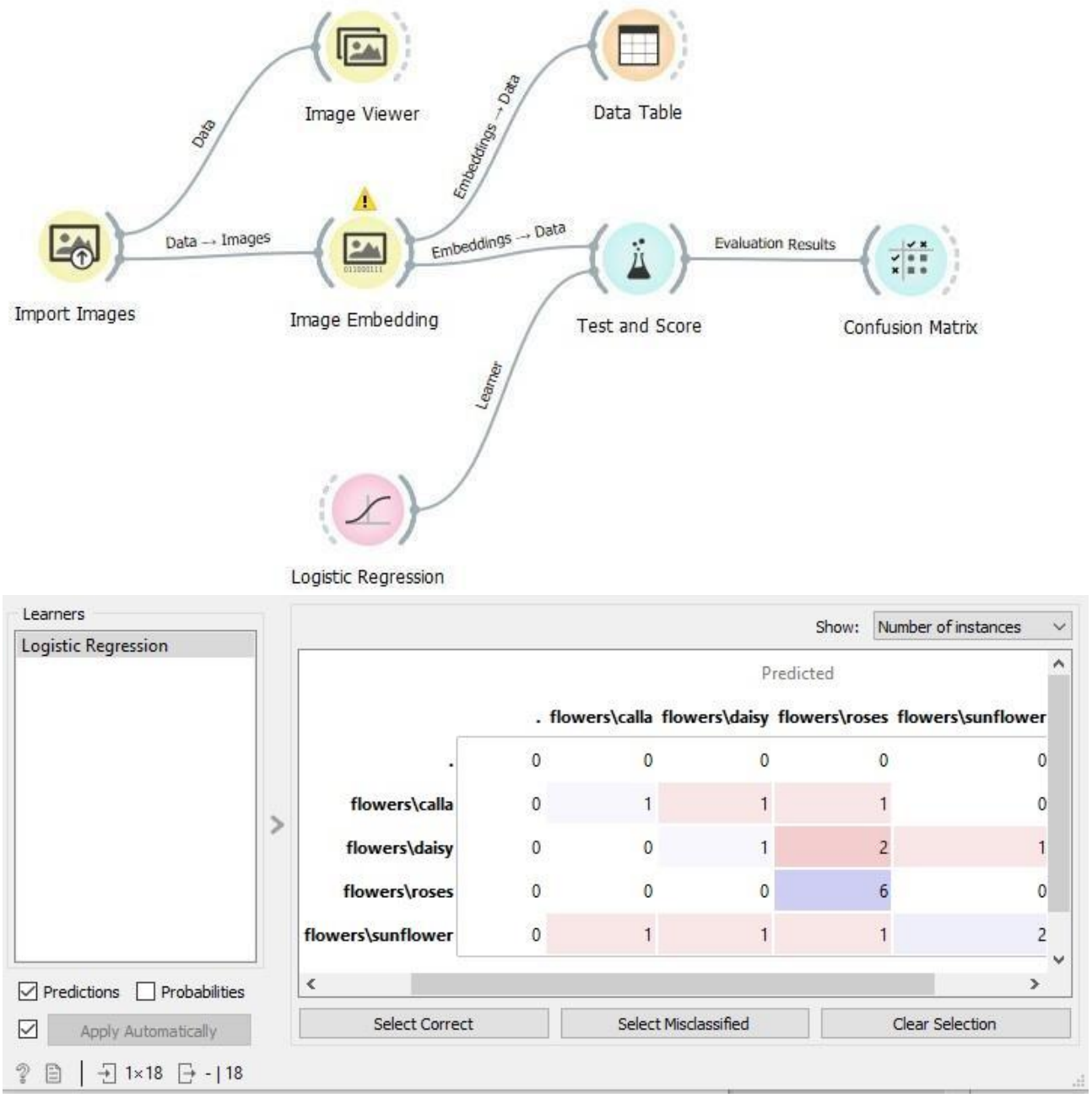


Image Viewer
Data Table
Data
Embeddings → Data
Import Images
Data → Images
Image Embedding
Embeddings → Data
Test and Score
Learner
Logistic Regression




➢ We now drag and drop a Confusion Matrix widget from the Evaluate section onto the workspace and connect it to the Test and Score widget.






➢ Drag and drop another Image Viewer widget to view the selected cell(s) from the Confusion Matrix.

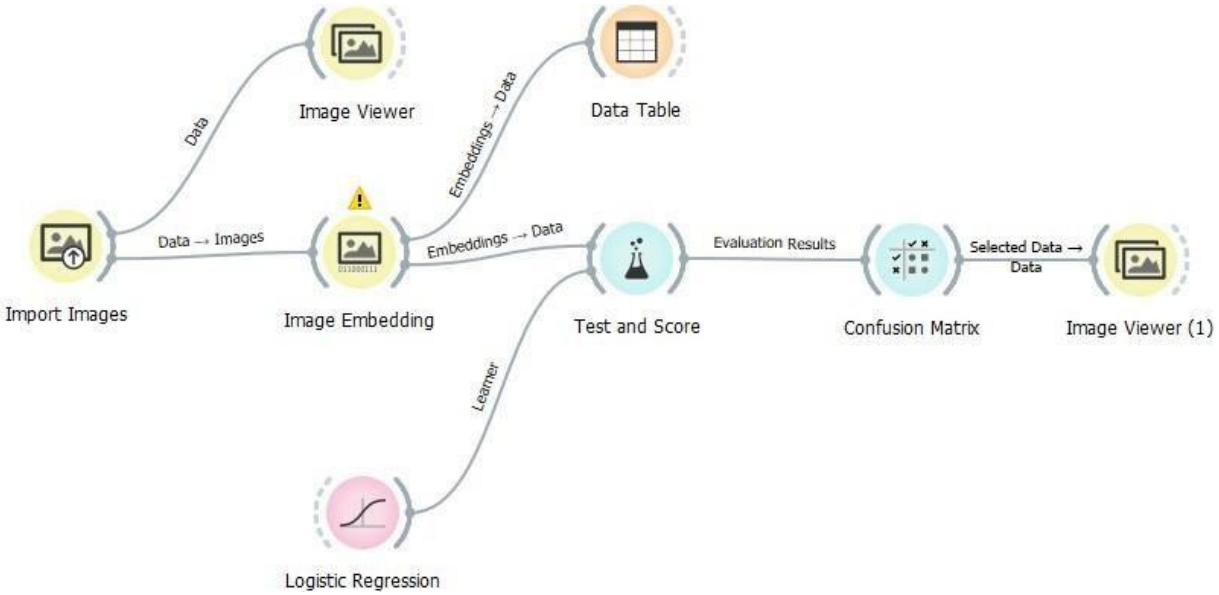
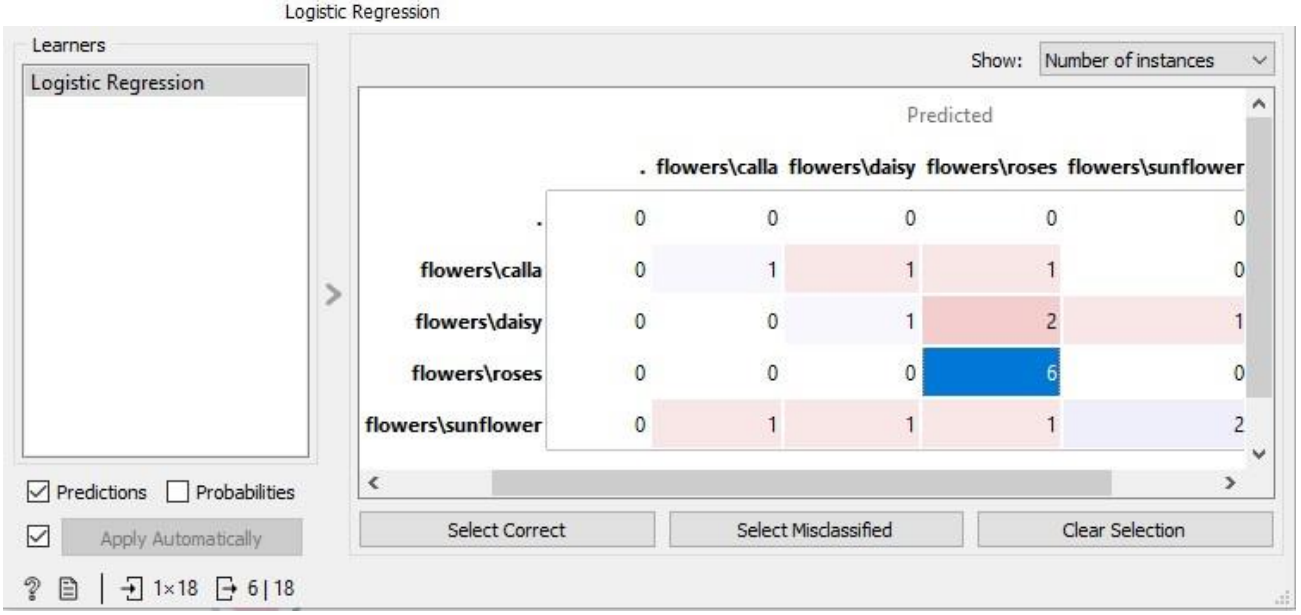
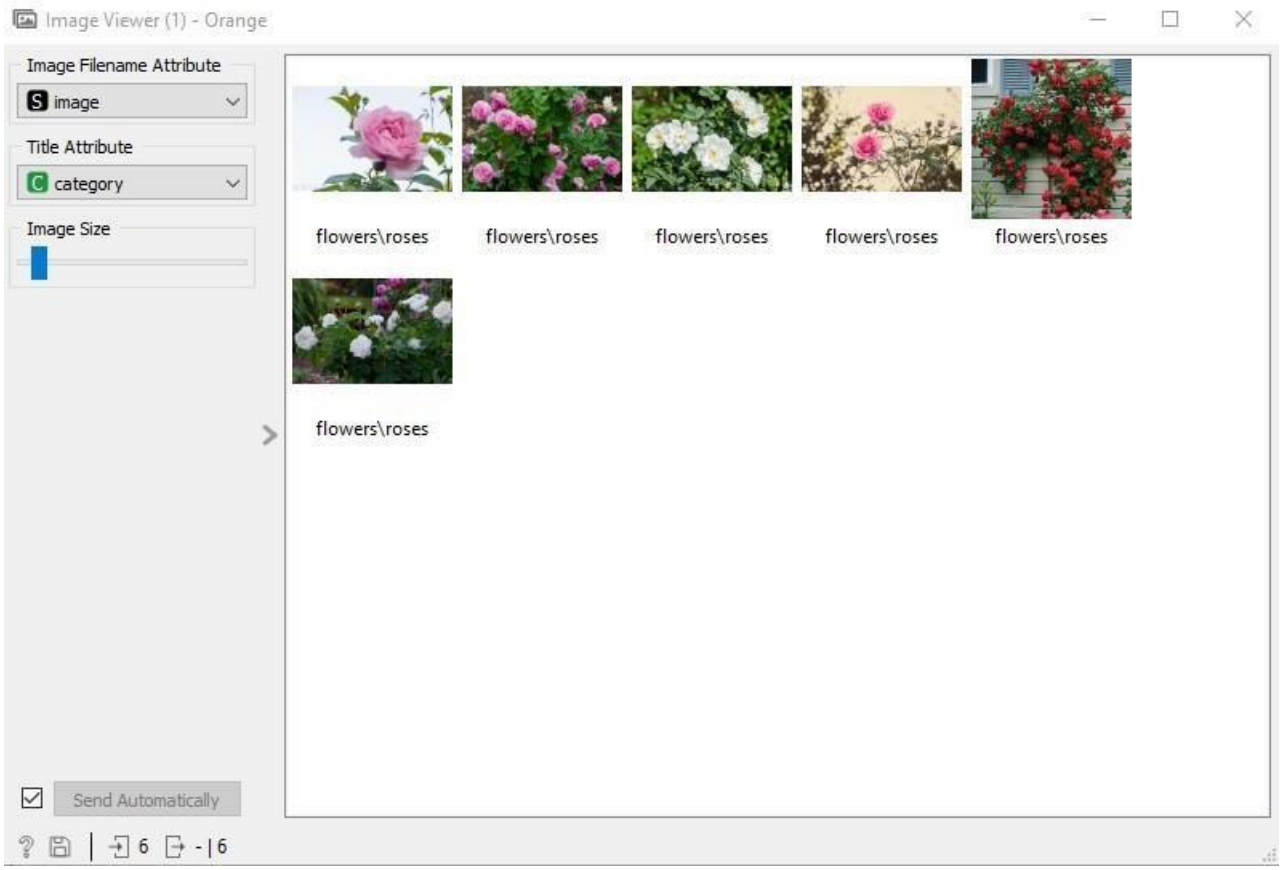


Image Viewer
Data Table
Data
Embeddings → Data
Data → Images
Embeddings → Data
Evaluation Results
Selected Data → Data
Import Images
Image Embedding
Test and Score
Confusion Matrix
Image Viewer (1)
Learner
Logistic Regression


Learners
Logistic Regression
Predictions
Probabilities
Apply Automatically
1×18
6 | 18
Show:
Number of instances
Predicted
. flowers\calla flowers\daisy flowers\roses flowers\sunflower
. 0 0 0 0 0
flowers\calla 0 1 1 1 0
flowers\daisy 0 0 1 2 1
flowers\roses 0 0 0 6 0
flowers\sunflower 0 1 1 1 2
Select Correct
Select Misclassified
Clear Selection




# Practical 4

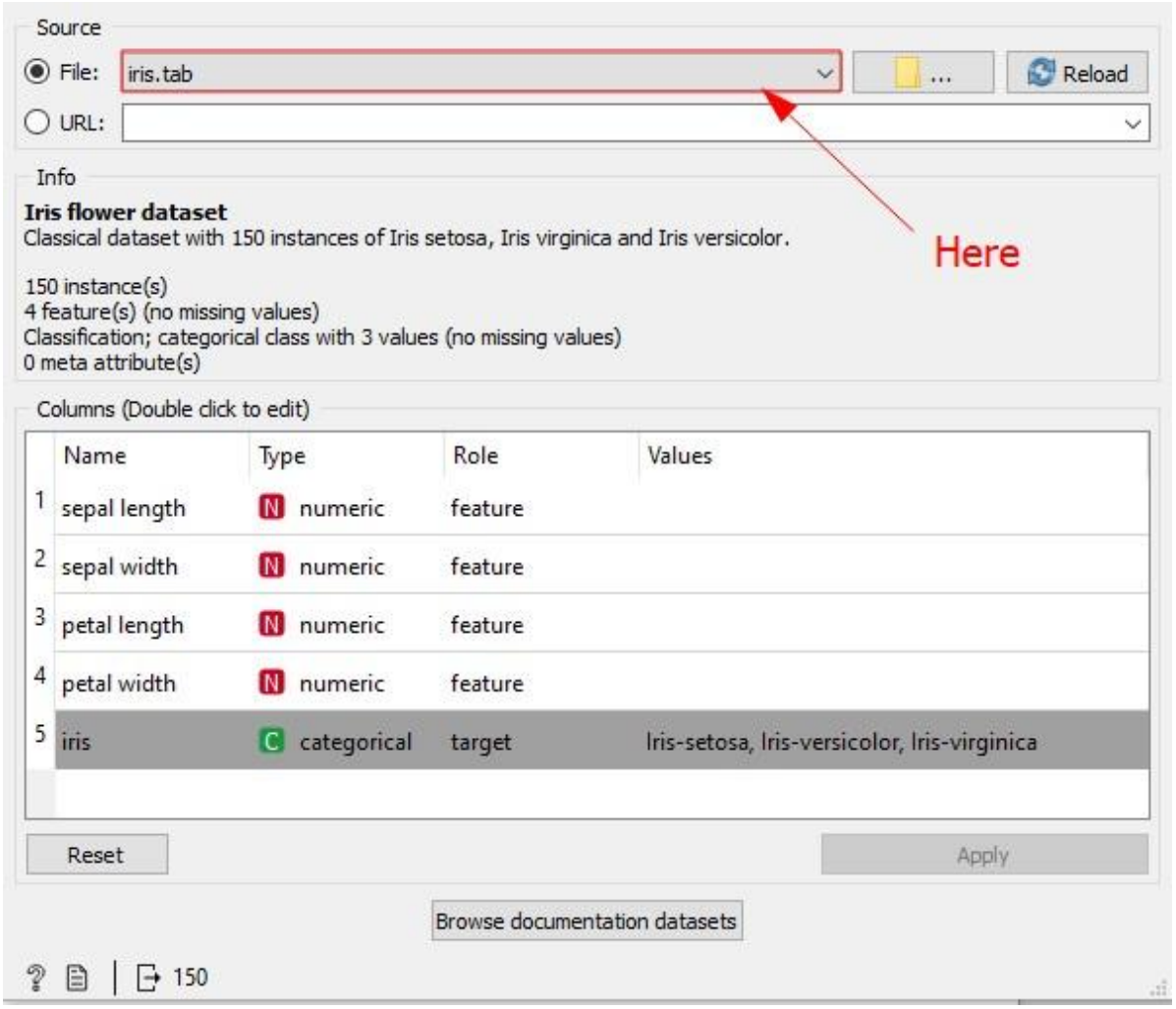
**Aim:** Hierarchical clustering using orange.

**Steps:**

➢ Drag and drop a File widget from the Data section onto the workspace.

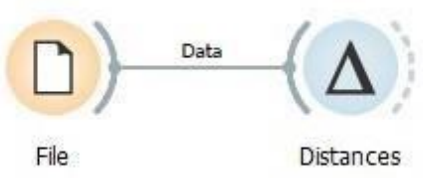


➢ Double click the File widget and set the name to iris.tab.


Source
File:
iris.tab
...
Reload
URL:
Info
Iris flower dataset
Classical dataset with 150 instances of Iris setosa, Iris virginica and Iris versicolor.
Here
150 instance(s)
4 feature(s) (no missing values)
Classification; categorical class with 3 values (no missing values)
0 meta attribute(s)
Columns (Double click to edit)
Name
Type
Role
Values
1 sepal length numeric feature
2 sepal width numeric feature
3 petal length numeric feature
4 petal width numeric feature
5 iris categorical target Iris-setosa, Iris-versicolor, Iris-virginica
Reset
Apply
Browse documentation datasets
150

➢

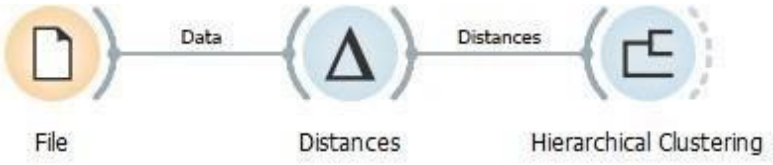
Drag and drop the Distances widget from the Unsupervised section onto the workspace and connect it to the File widget.


Drag and drop a Hierarchical Clustering widget from the Unsupervised section to the workspace and connect it to the Distances widget.

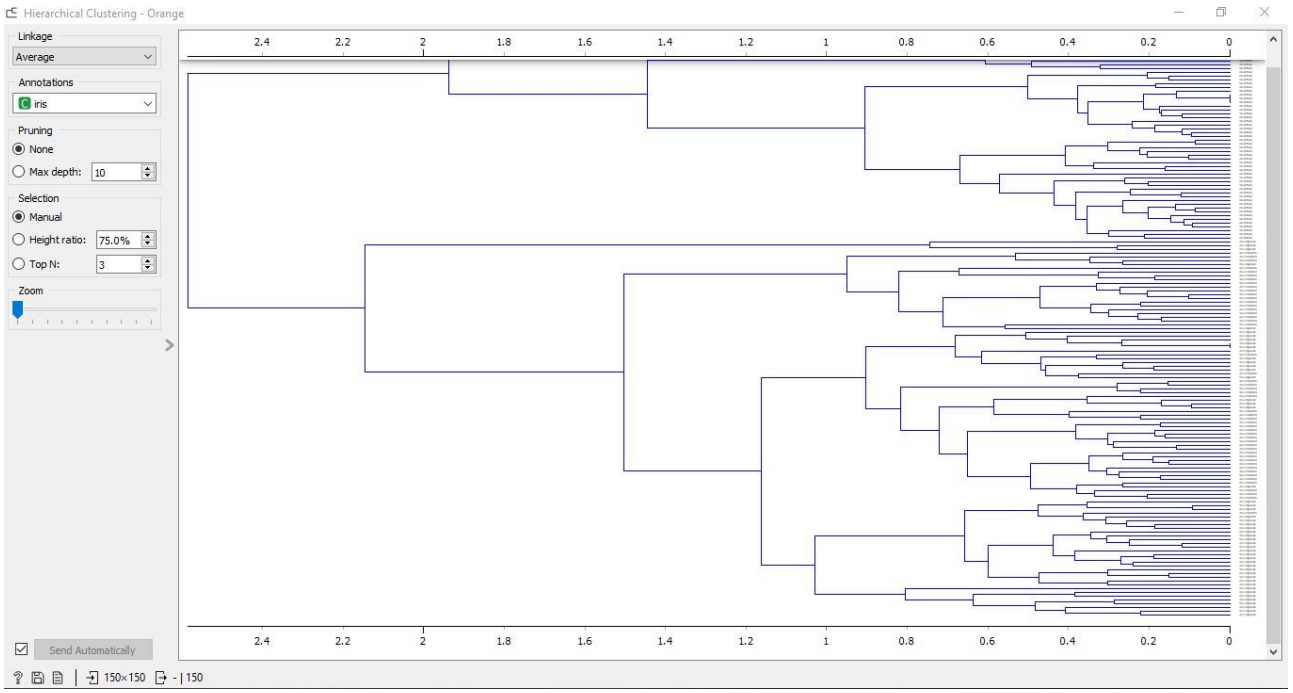
➢

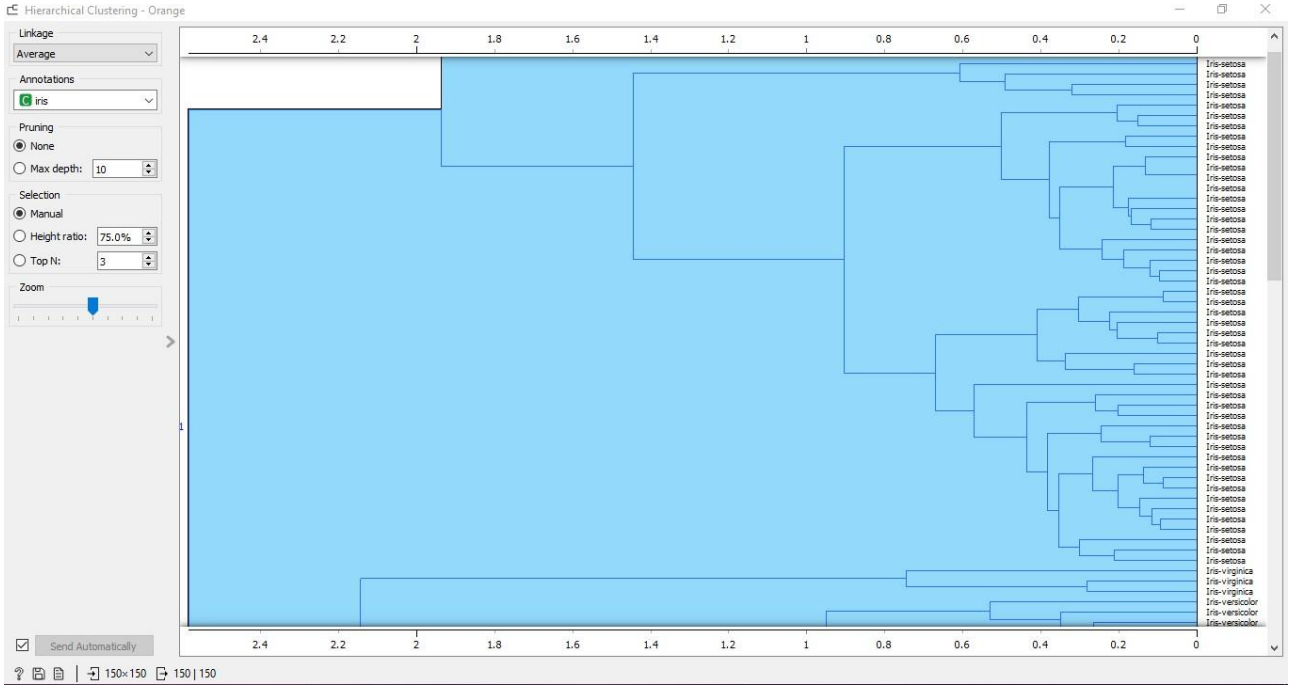

Unsupervised
This
Distance File
Distance Matrix
t-SNE
Distance Map
Hierarchical Clustering
k-Means
Louvain Clustering
DBSCAN
Manifold Learning
PCA
Correspon... Analysis
Distances
Distance Transforma...
MDS
Save Distance Matrix
Self-Organi... Map


Data
Distances
File
Distances
Hierarchical Clustering

➢

Double click the Hierarchical Clustering  widget to view the dendogram. Select any sub-cluster as per convenience.

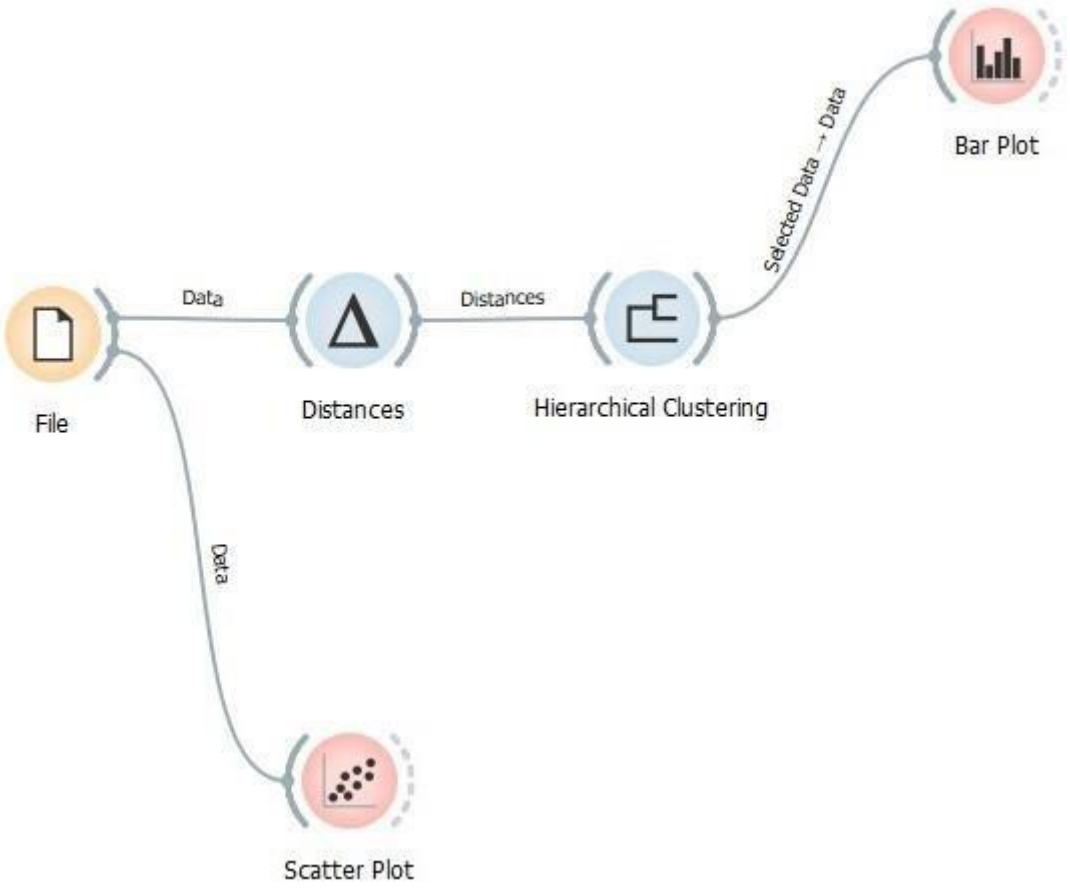


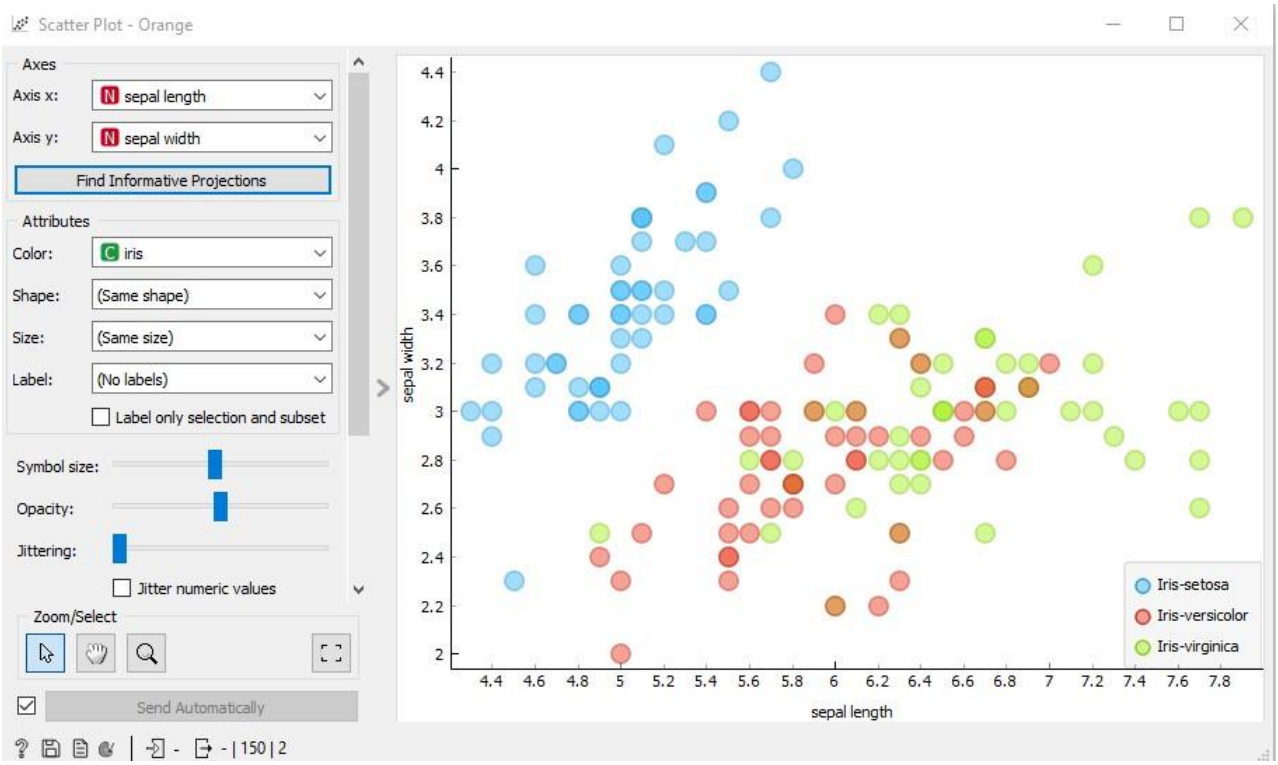


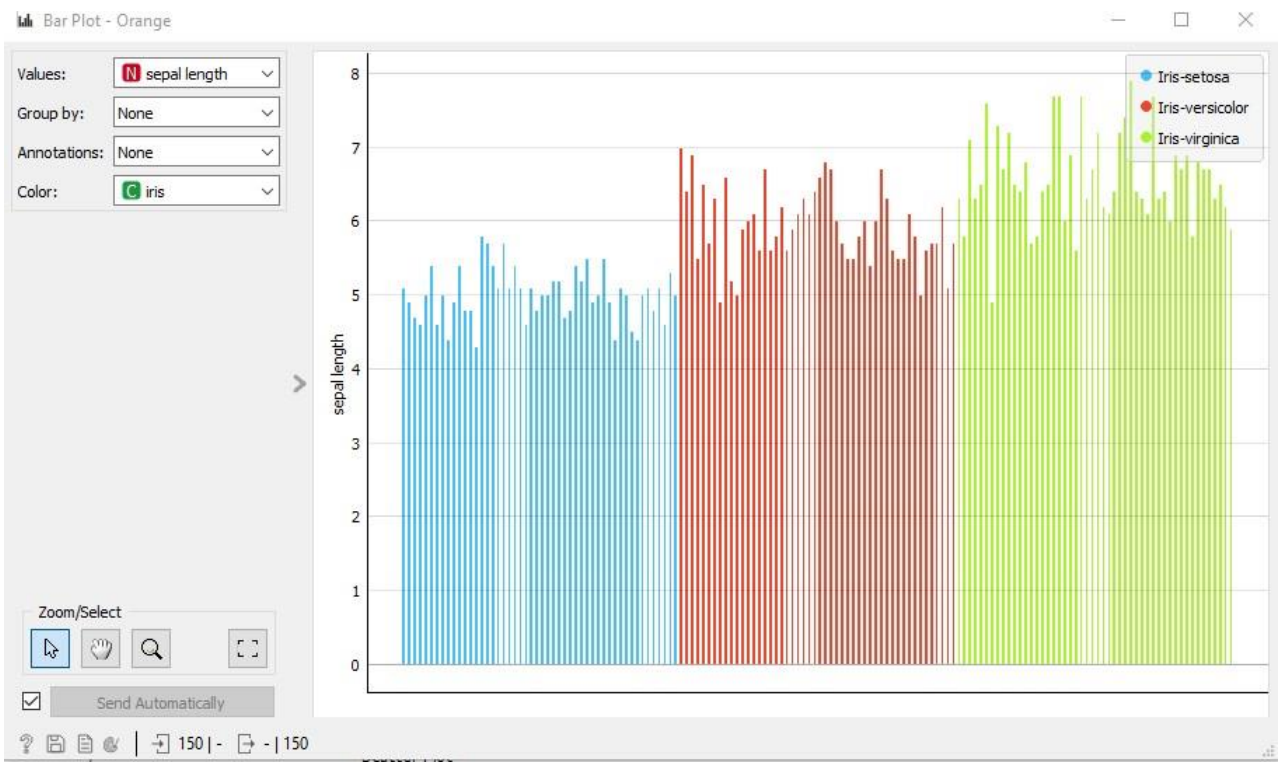

Choose any visualization method of your choice. This example assumes a Bar Plot for the sub-cluster and a Scatter Plot for the source dataset. You can find both of these widgets in the Visualize section. Connect the Bar Plot to the Hierarchical Clustering widget and Scatter Plot to the File widget.

➢


Visualize
These
Tree Viewer
Box Plot
Violin Plot
Distributions
Scatter Plot
Line Plot
Bar Plot
Sieve Diagram
Mosaic Display
FreeViz
Linear Projection
Radviz
Heat Map
Venn Diagram
Silhouette Plot
Pythagorean Tree
Pythagorean Forest
CN2 Rule Viewer
Nomogram


Bar Plot
Selected Data → Data
Data
Distances
Distances
Hierarchical Clustering
File
Data
Scatter Plot


Scatter Plot - Orange
Axes
Axis x: sepal length
Axis y: sepal width
Find Informative Projections
Attributes
Color: iris
Shape: (Same shape)
Size: (Same size)
Label: (No labels)
Label only selection and subset
Symbol size:
Opacity:
Jittering:
Jitter numeric values
Zoom/Select
Send Automatically
- | 150 | 2
sepal width
sepal length
Iris-setosa
Iris-versicolor
Iris-virginica

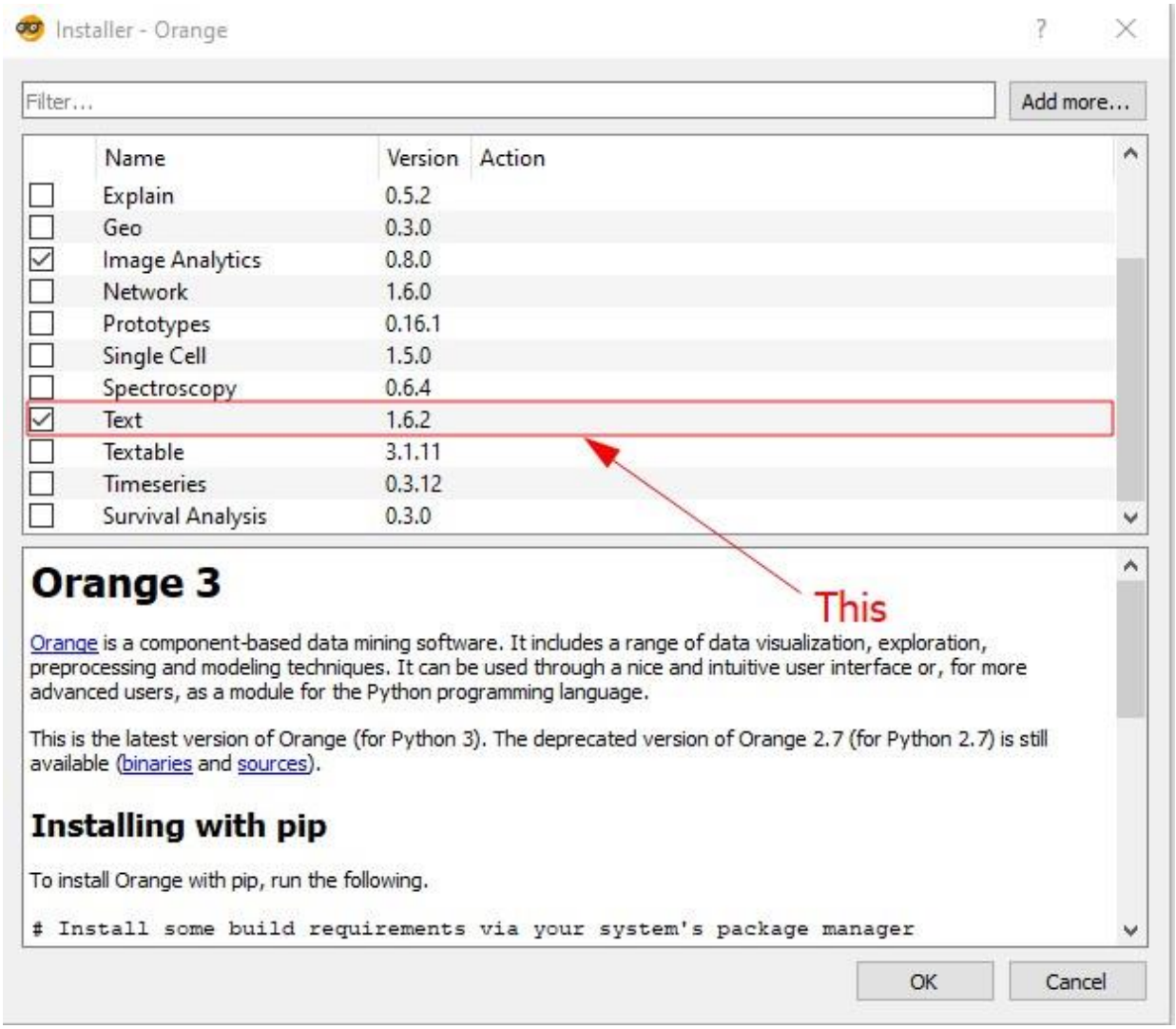

Bar Plot - Orange
Values:
sepal length
Group by:
None
Annotations:
None
Color:
iris
Zoom/Select
Send Automatically
150 | -
- | 150
sepal length
0
1
2
3
4
5
6
7
8
Iris-setosa
Iris-versicolor
Iris-virginica

# Practical 5

**Aim:** Text Preprocessing using orange.

**Steps:**

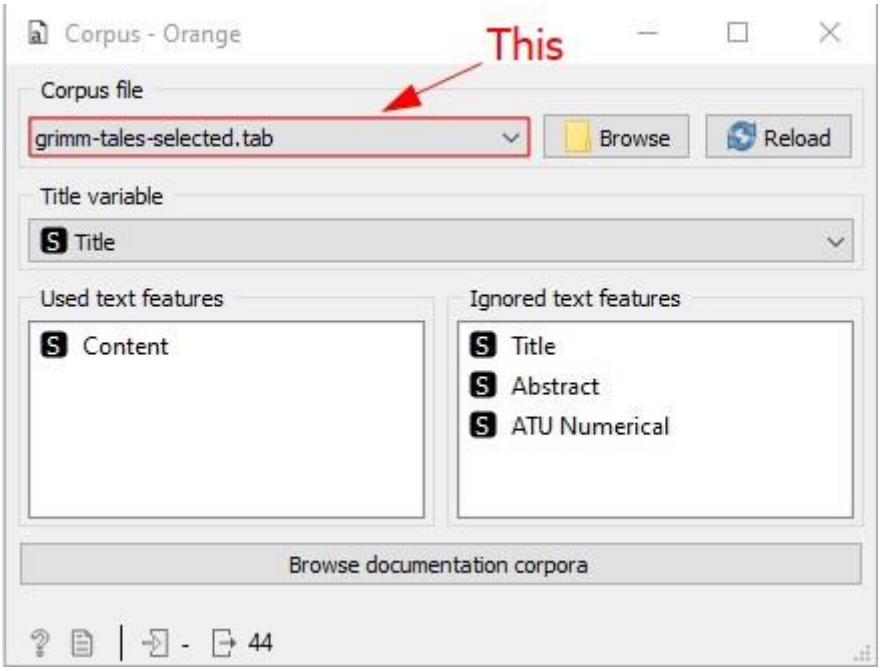
➢ Before starting, we need to install the Text add-on. Install it by navigating to Options > Add ons…. You will be prompted to restart Orange after the installation completes. If it is already installed, skip this step.



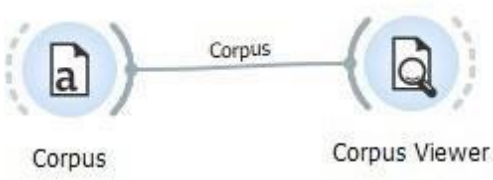

➢ Drag and drop a Corpus widget to the workspace. It can be found in the newly added Text Mining section.



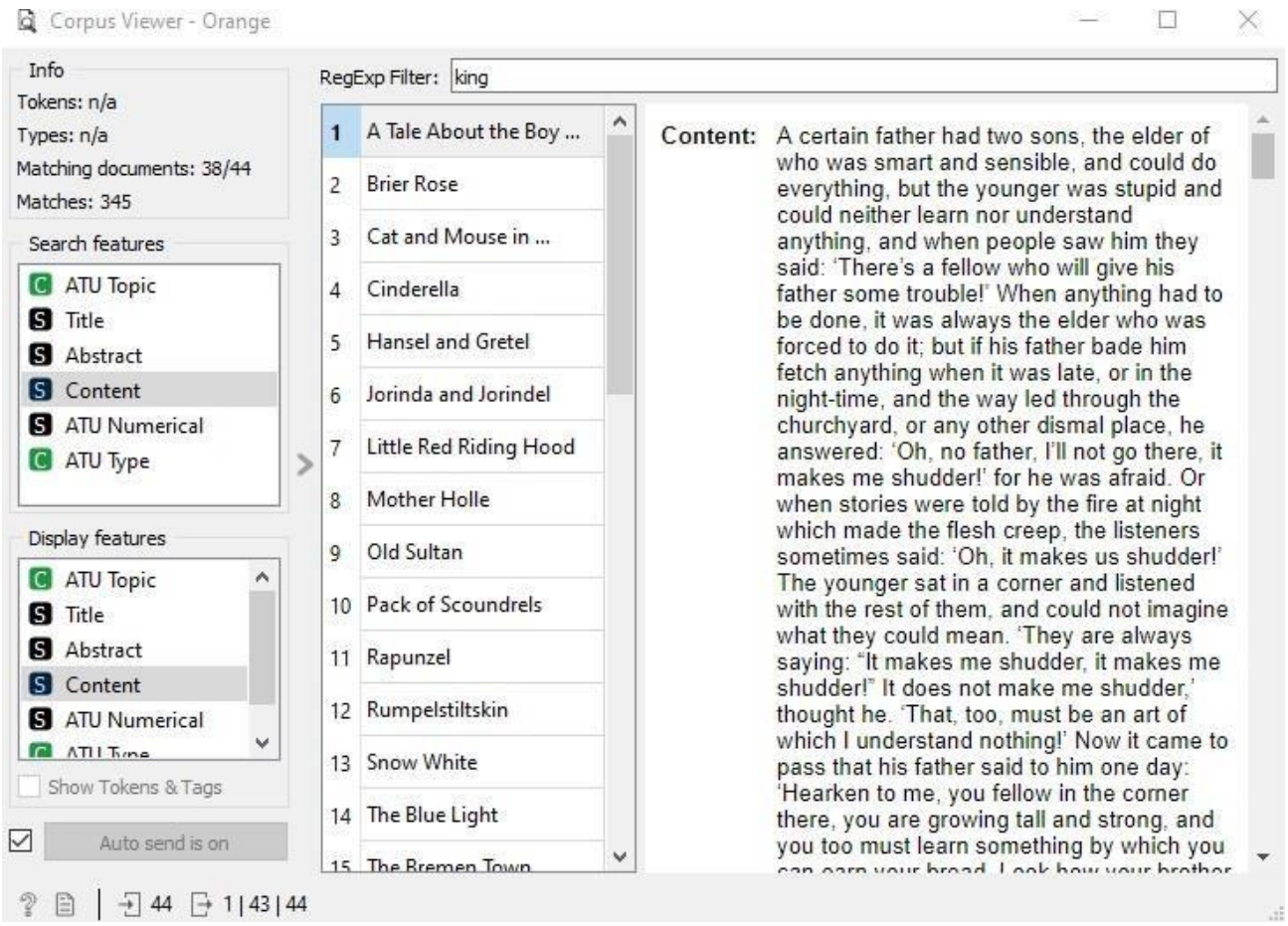
➢ Double click the Corpus widget and select the grimm-tales-selected.tab corpus file.



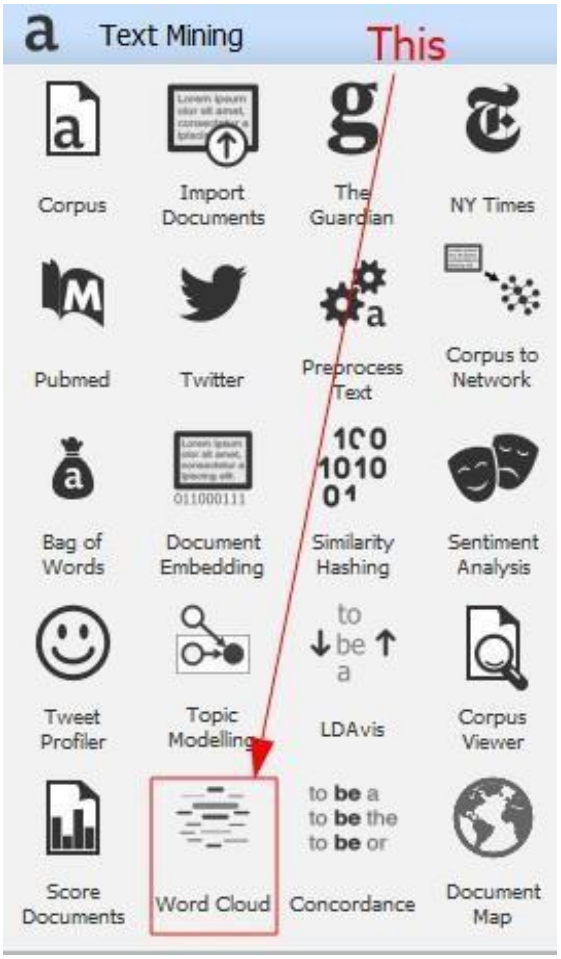

➢ Drag and drop a Corpus Viewer widget and connect it to the Corpus widget. The Corpus Viewer widget can be found in the Text Mining section.

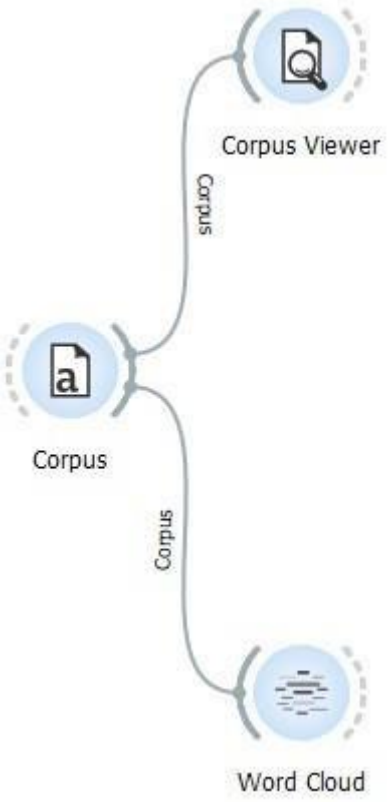



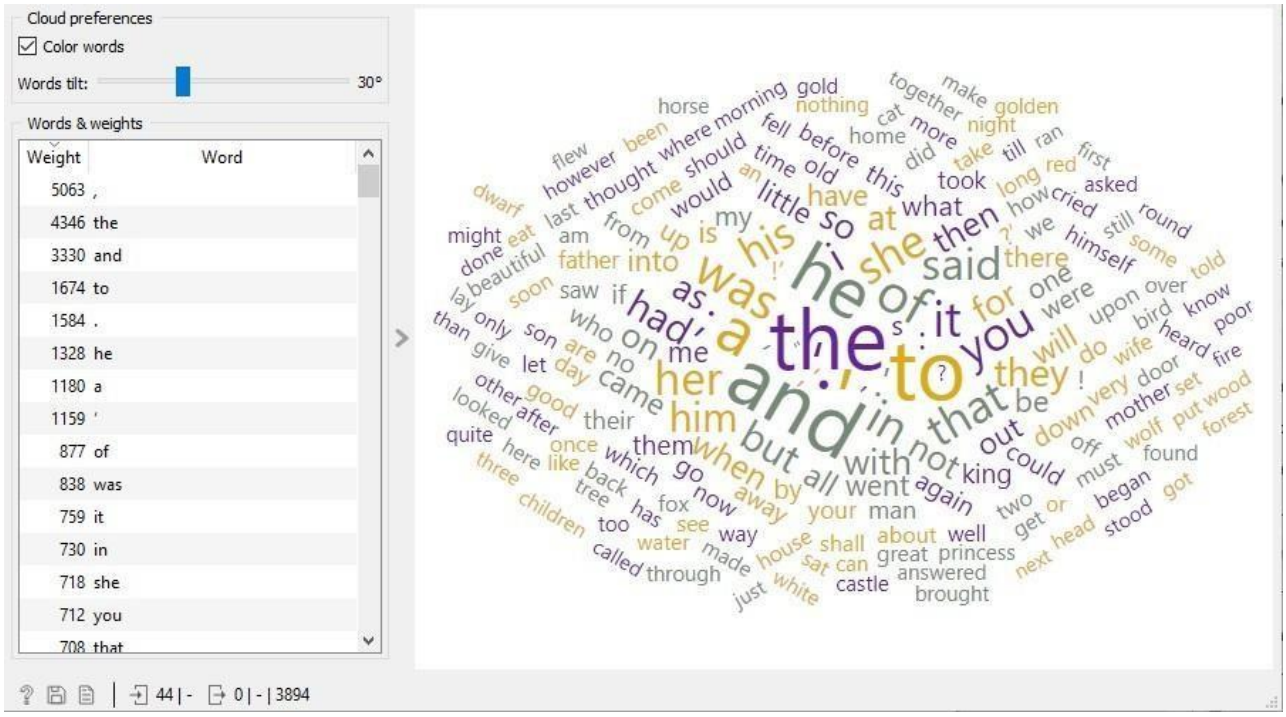

➢ Double-clicking the Corpus Viewer allows us to peek through the corpus and also allows us to filter text.




➢ Another method of visualizing data is though Word Clouds. Drag and drop a Word Cloud widget from the Text Mining section and connect it to the Corpus widget.

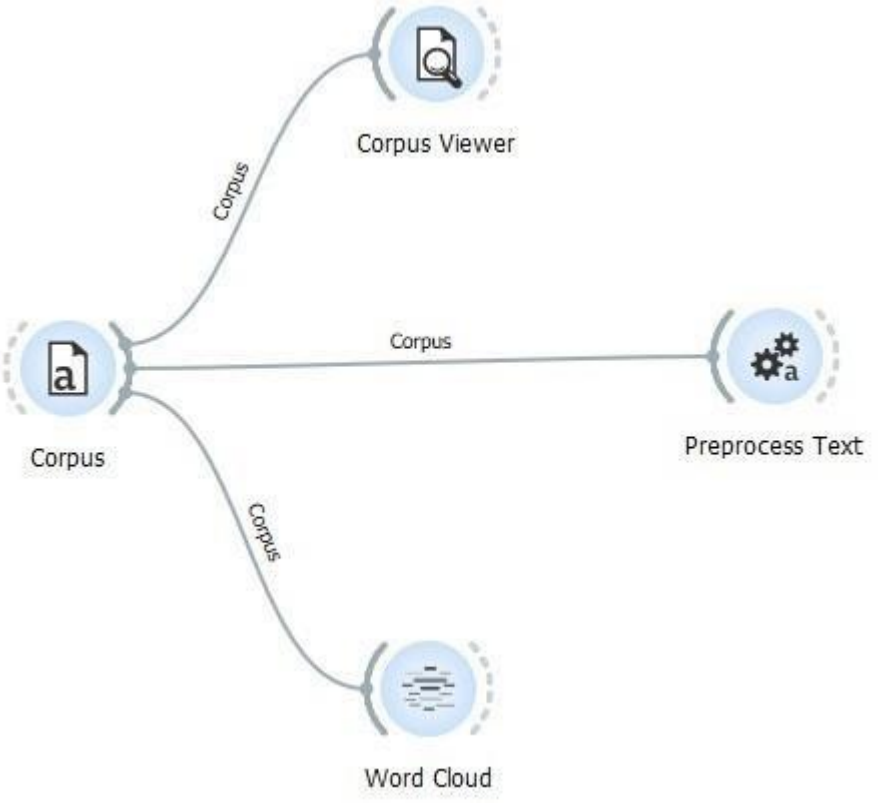

Text Mining
This
Corpus
Import Documents
The Guardian
NY Times
Pubmed
Twitter
Preprocess Text
Corpus to Network
Bag of Words
Document Embedding
Similarity Hashing
Sentiment Analysis
Tweet Profiler
Topic Modelling
LDAvis
Corpus Viewer
Score Documents
Word Cloud
Concordance
Document Map



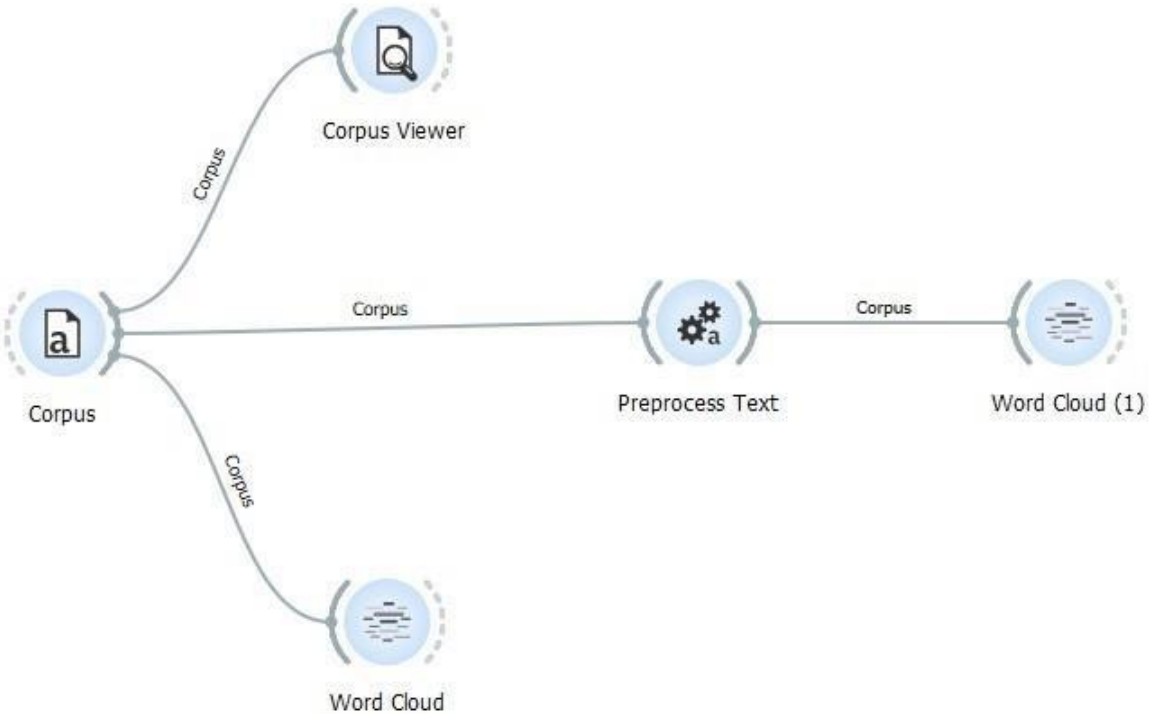



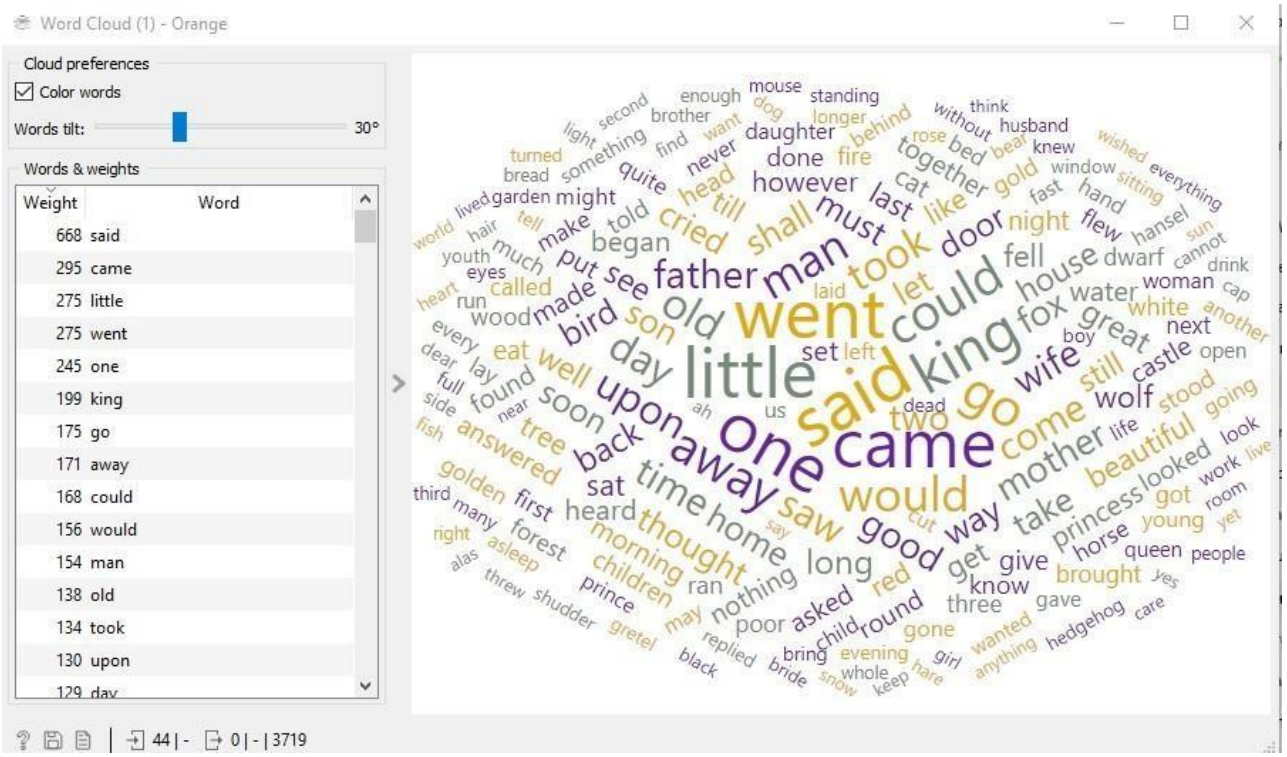

➢ We see that a lot of punctuation marks and uninformative words have made their way into the Word Cloud. In order to eliminate this, we have to use the Preprocess Text widget. Drag and drop a Preprocess

Text widget from the Text Mining section onto the workspace and connect it to the Corpus widget.

➢ We now add another Word Cloud  widget to see our updated cloud.






# Practical 6

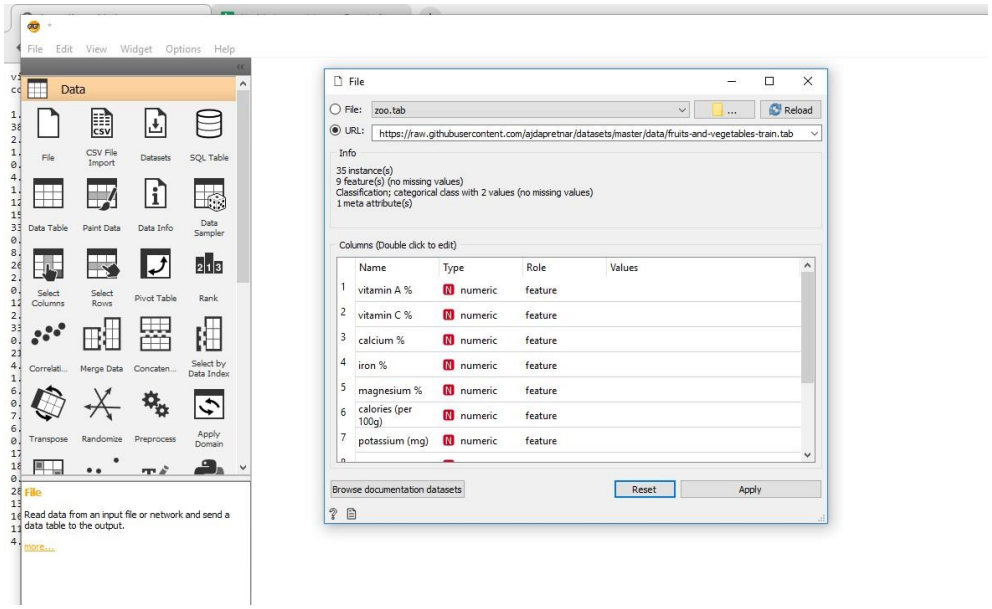
**Aim**: To predict whether the given dataset is of fruit or vegetable using orange.

**Description**:

This dataset contain numerous feature which diffrenciate whether the given dataset is of vegetable or fruit. The target variable is classification i.e  Is it fruit or vegetable.

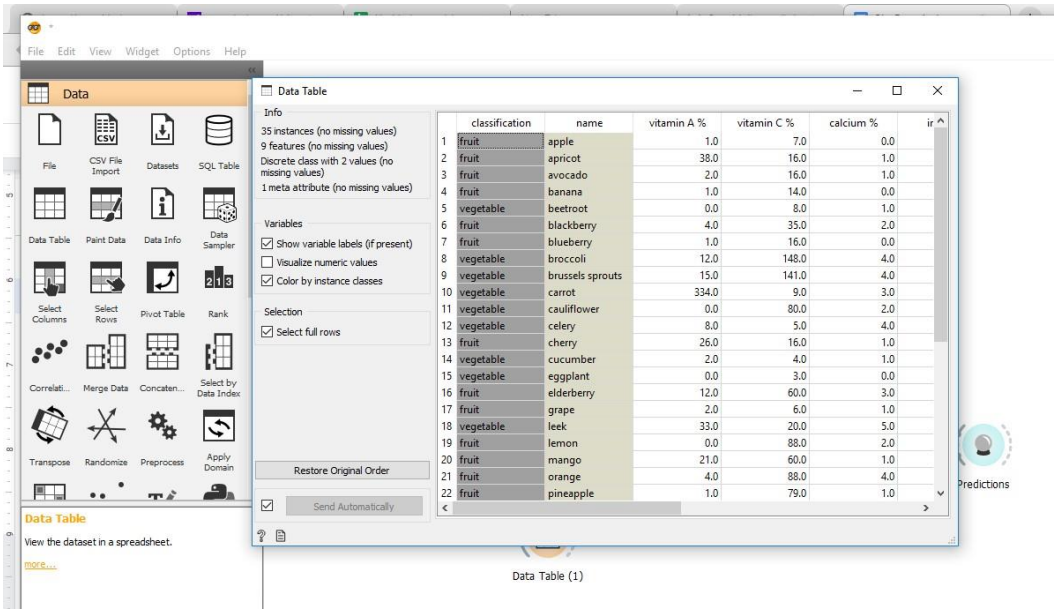
**Data selection:**

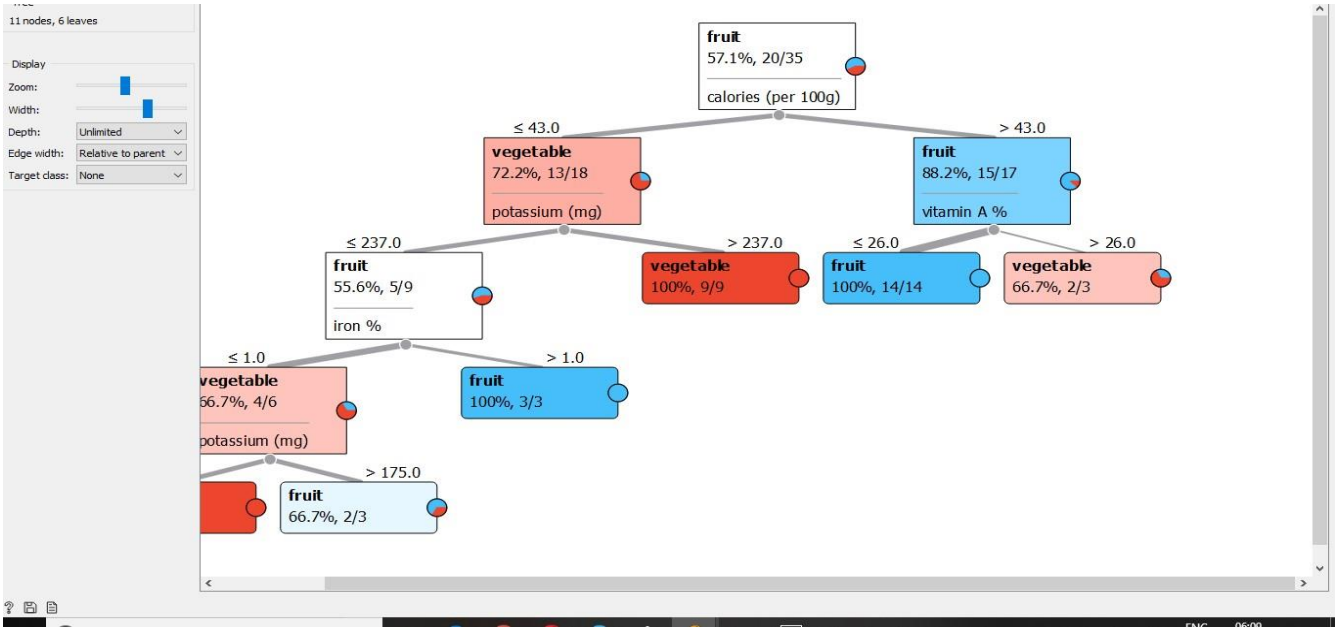
We have given the url of the dataset which contain  35 instances and 9 features of fruit and vegetables.



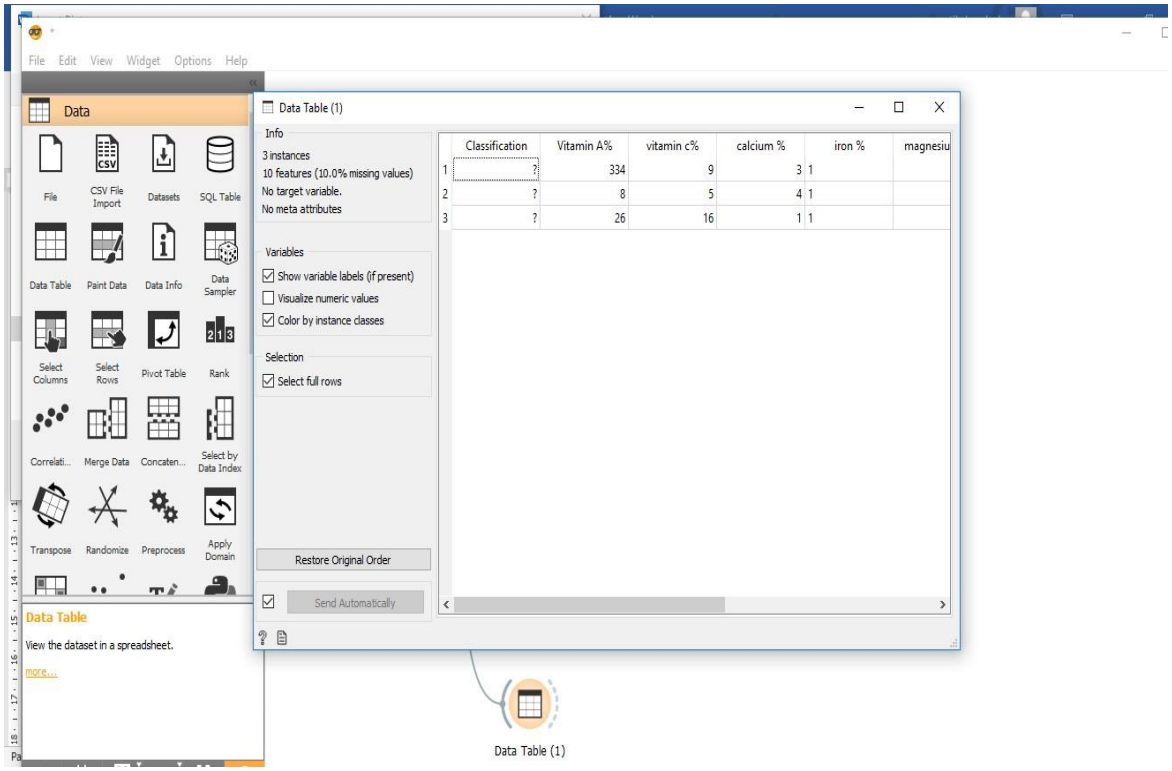

Data visualization:

We visualize the data by using data table and classification tree.

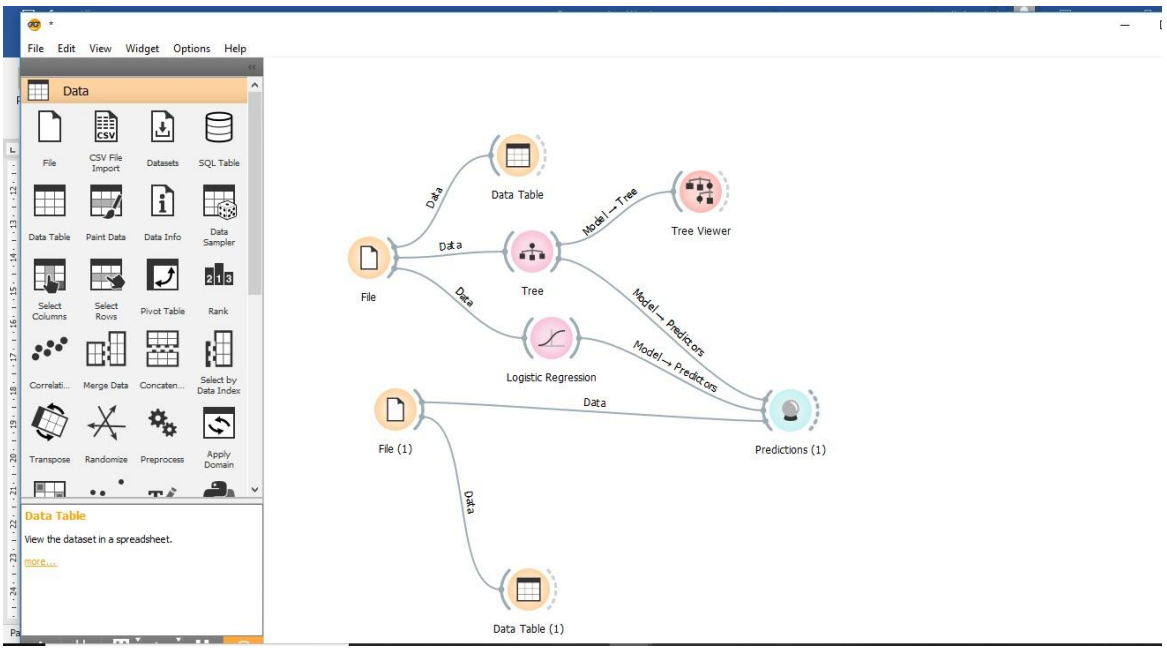


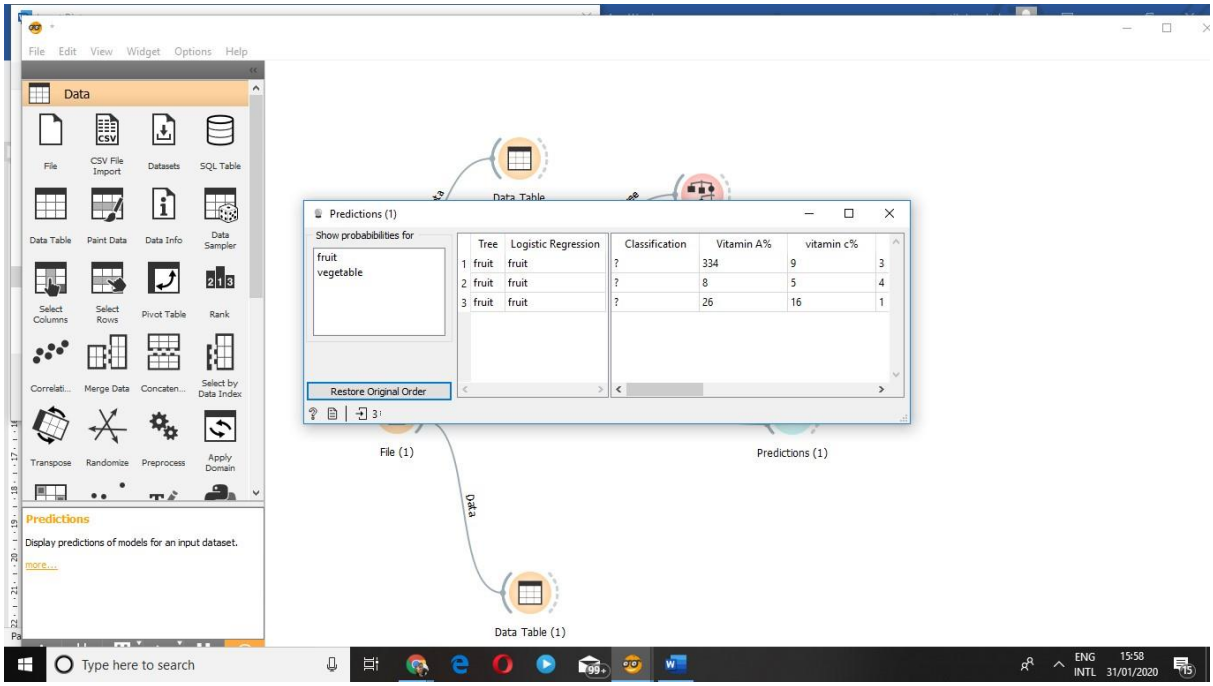




Again ,You have to create the the dataset of plants which you need to predict and visualize it in data table.




By using prediction widget you need to predict whether the plant is vegetable or fruit .






The given prediction is again checked by logistic regression.

# Practical 7

**Aim**: Predict whether using orange.

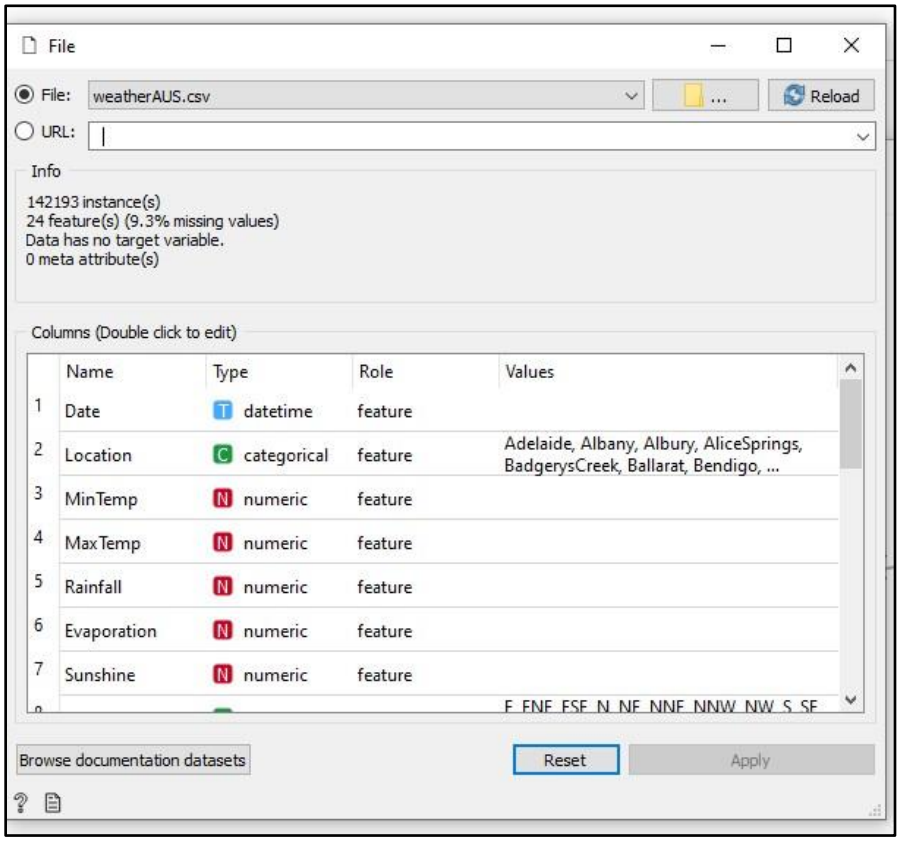
**Description**: This dataset contains daily weather observations from numerous Australian weather stations.

The target variable Rain Tomorrow means: Did it rain the next day?

Yes or No.

**Data Selection:**

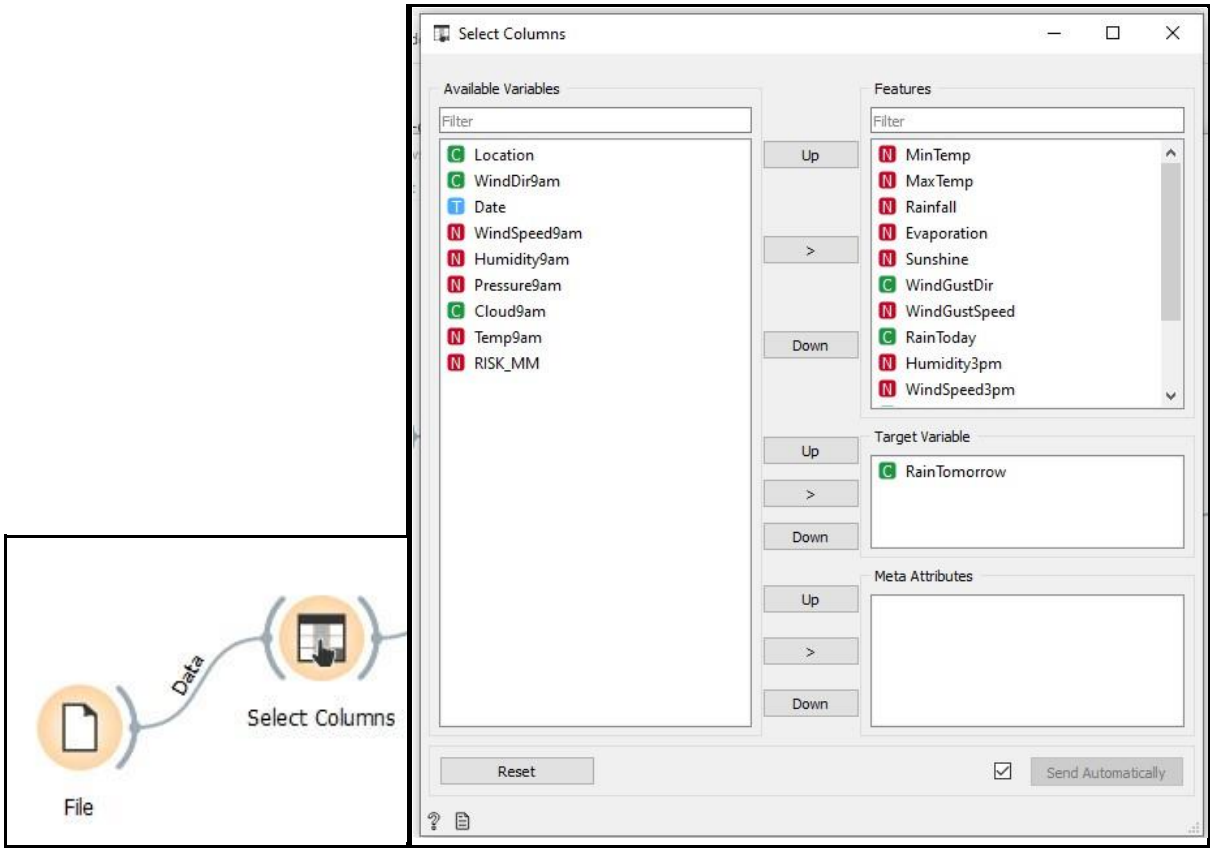
We have downloaded the dataset ( weather dataset ) of Australian weather stations which contains about 10 years of daily weather observations from numerous Australian weather stations.




**Data Cleaning:**

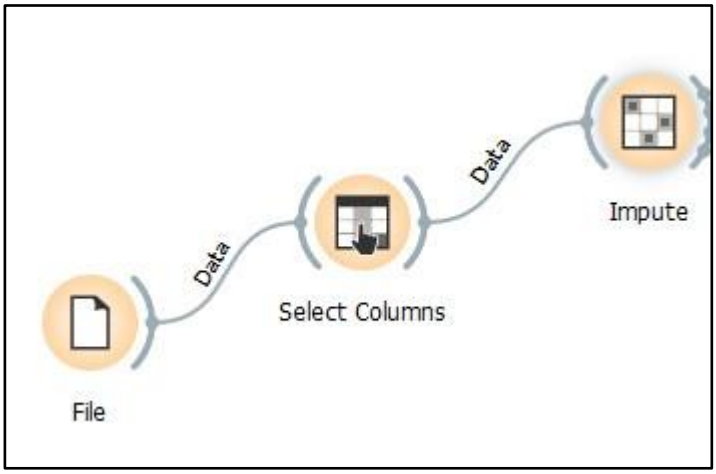
In data cleaning, we will select the required column and remove the rows with missing values as shown below:

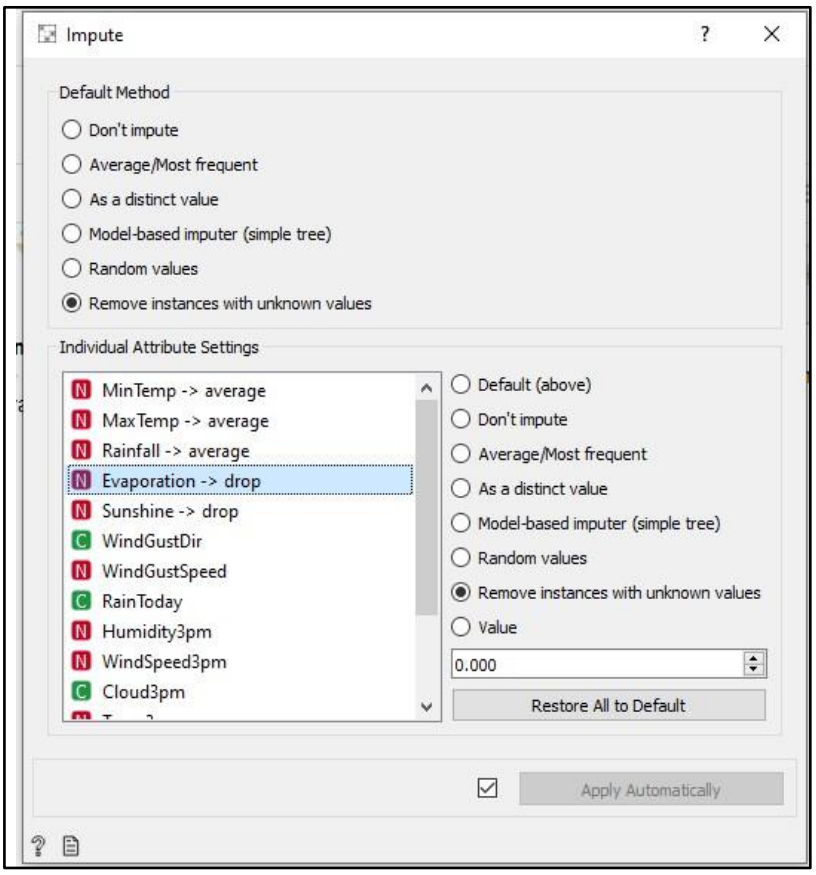
## Column Selection




## Removing rows with missing values

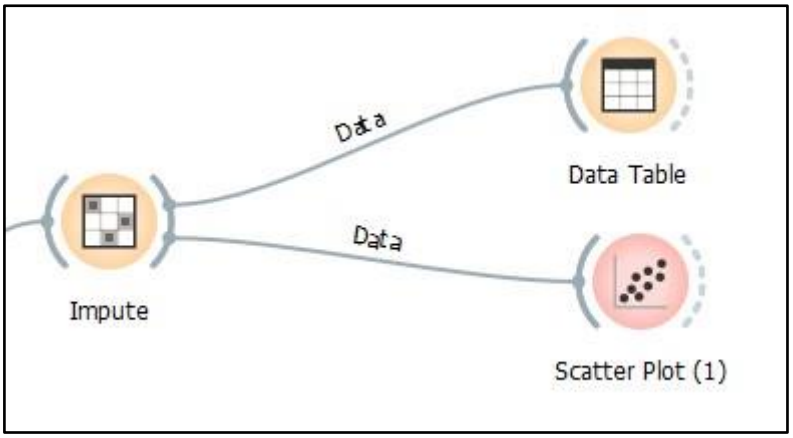
We will use the impute function to remove rows with missing values for columns “Sunshine” and “Evaporation”





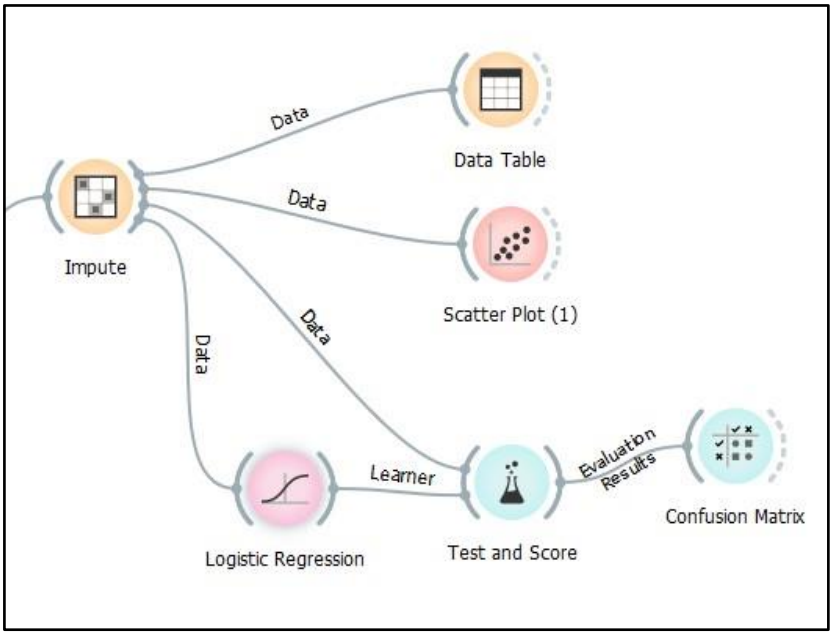

## Data Visualization

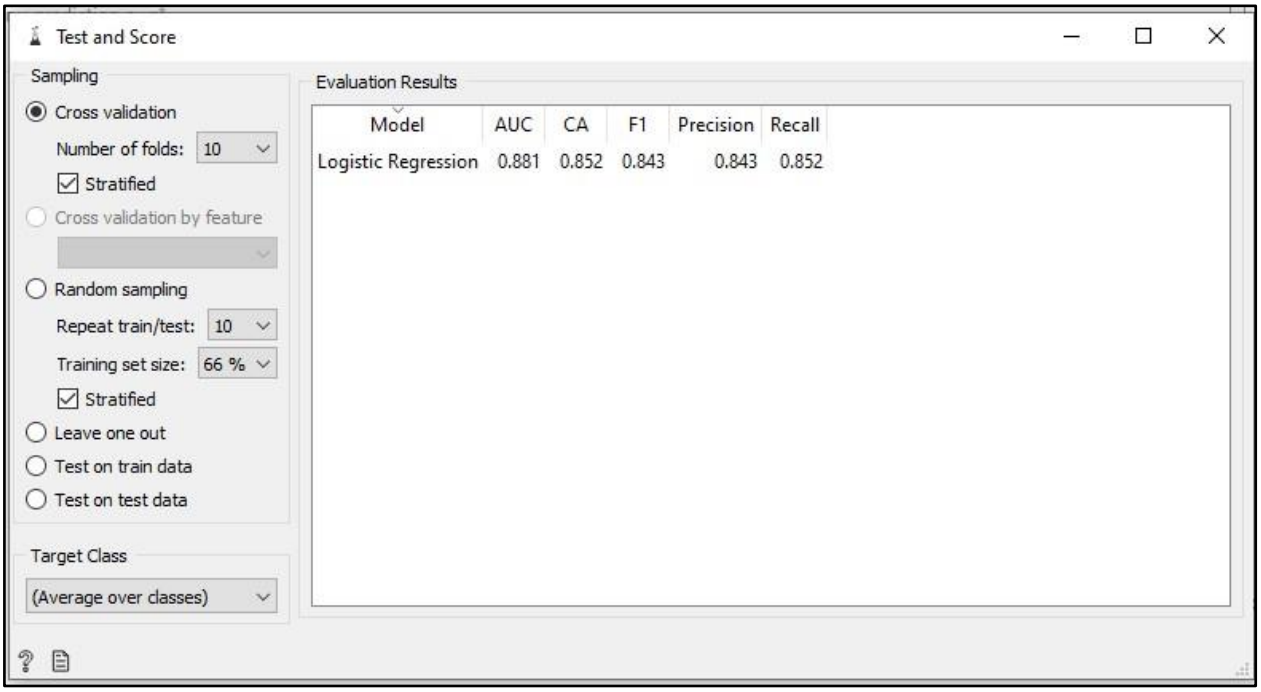
In this step, we see the reflected data selection in data table. Then, we use scatter plot to visualize the data for better understanding of our dataset.

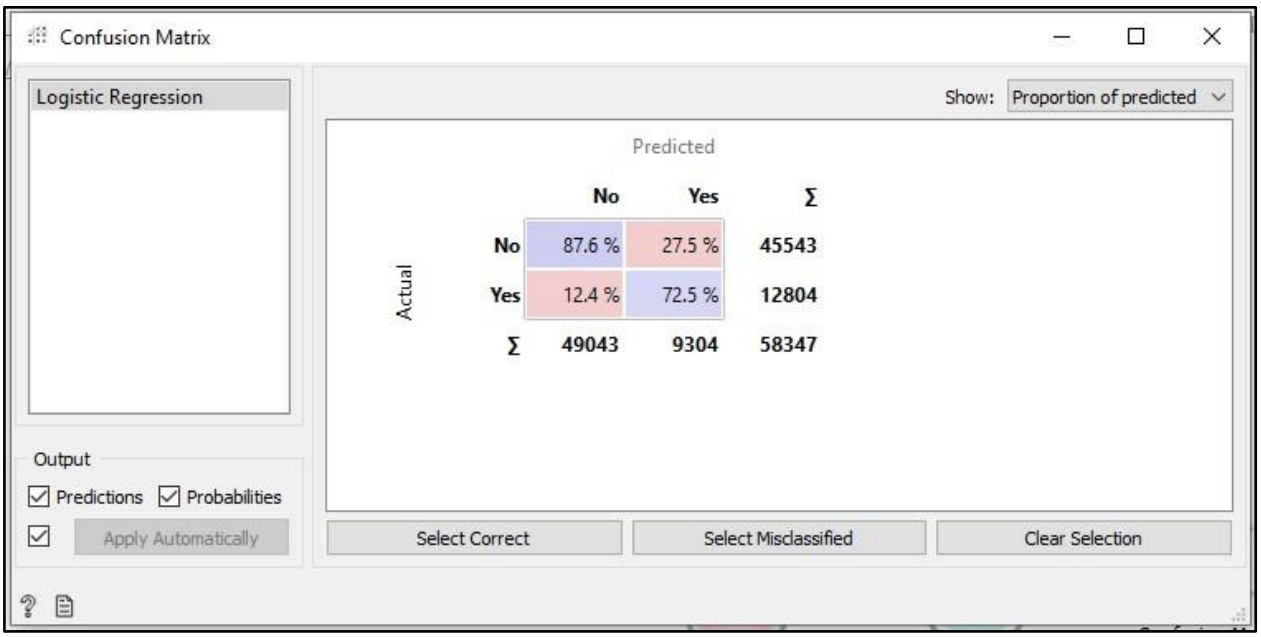



In the above scatter plot we see, as the humidity level increases and evaporation rates are low the chances of rainfall increases (red dots) **Data Modeling**

In this step, we use **Logistic regression** to model our data. Then, we use "test and score" function to evaluate the performance of our model. Finally, we use "confusion matrix" to understand the prediction.




Confusion Matrix
Logistic Regression
Show:
Proportion of predicted
Predicted
No
Yes
Σ
Actual
No
87.6 %
27.5 %
45543
Yes
12.4 %
72.5 %
12804
Σ
49043
9304
58347
Output
Predictions
Probabilities
Apply Automatically
Select Correct
Select Misclassified
Clear Selection

# Practical 8

**Aim:** Write a java program to Calculate the Alon Matias Szegedy Algorithm for given stream. **Input:**

```
import java.io.*; import
java.util.*;

public class AMSA {

   public static int findCharCount(String stream, char XE, int random, int length) {
int countOccurence = 0;

      for(int i = random; i < length; i++)
      {
         if(stream.charAt(i) == XE)
         {
            countOccurence++;
         }
      }



      return countOccurence;
   }

   public static int estimateValue(int XV1, int n) {
int expValue;
```

```
      expValue = n * (2 * XV1 - 1);
return expValue;
   }

   public static void main(String[] args) {
int n = 15;
      String stream = "abcbdacdabdcaab";

      int randomValues[] = {3, 8, 13};
char[] XE = new char[3];       int[]
XV = new int[3];       int[] expValue
= new int[3];       int
apprSecondMomentValue;

      for(int i = 0; i < randomValues.length; i++)
      {
         XE[i] = stream.charAt(randomValues[i] - 1);
      }

      for(int i = 0; i < randomValues.length; i++)
      {
         XV[i] = findCharCount(stream, XE[i], randomValues[i] - 1, n);
      }

      System.out.println(XE[0] + "=" + XV[0] + " " + XE[1] + "=" + XV[1] + " " + XE[2] +
"=" + XV[2]);

      for(int i = 0; i < randomValues.length; i++)
      {
         expValue[i] = estimateValue(XV[i], n);
      }

      for(int i = 0; i < randomValues.length; i++)
      {
```

```
        System.out.println("Expected value for "+XE[i]+" is :: "+expValue[i]);
      }


      apprSecondMomentValue = Arrays.stream(expValue).sum() / 3;
      System.out.println("Second moment is:" + apprSecondMomentValue);
    }
}
```

## Output:

# Practical 9

**Aim:** Write a Program to Construct different types of K-shingles for a given document

**Source code:** require("tm")

```
kshingle<-function(){
  k<- as.integer(readline("Enter a value for k - 1"))

  u1<- readLines("BIBD_1.txt")

  shingle<-i<-0
  while(i<nchar(u1)-k+1)
  {
    shingle[i]<-substr(u1,i,i+k)
print(shingle[i])

    i<-i+1
  }
}

if(interactive())kshingle()
```

**Output:**

```
> require("tm")
>
> kshingle<-function(){
+   k<- as.integer(readline("Enter a value for k - 1"))
+
+   u1<- readLines("BIBD1.txt")
+
+   shingle<-i<-0
+   while(i<nchar(u1)-k+1)
+   {
+     shingle[i]<-substr(u1,i,i+k)
+     print(shingle[i])
+
+     i<-i+1
+   }
+ }
>
> if(interactive())kshingle()
Enter a value for k - 12
character(0)
[1] "Lor"
[1] "ore"
[1] "rem"
[1] "em "
[1] "m i"
[1] " ip"
[1] "ips"
[1] "psu"
[1] "sum"
[1] "um "
[1] "m d"
[1] " do"
[1] "dol"
[1] "olo"
[1] "lor"
[1] "or "
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[1] "por"
[1] "or "
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[1] " in"
[1] "inc"
[1] "nci"
[1] "cid"
[1] "idi"
[1] "did"
[1] "idu"
[1] "dun"
[1] "unt"
[1] "nt "
[1] "t u"
[1] " ut"
[1] "ut "
[1] "t l"
[1] " la"
```

| | | | | | |
|---|---|---|---|---|---|
| [1] "lab" | [1] " ad" | [1] "ati" | [1] "x e" | [1] "e d" | [1] "vel" |
| [1] "abo" | [1] "ad " | [1] "tio" | [1] " ea" | [1] " do" | [1] "eli" |
| [1] "bor" | [1] "d m" | [1] "ion" | [1] "ea " | [1] "dol" | [1] "lit" |
| [1] "ore" | [1] " mi" | [1] "on " | [1] "a c" | [1] "olo" | [1] "it " |
| [1] "re " | [1] "min" | [1] "n u" | [1] " co" | [1] "lor" | [1] "t e" |
| [1] "e e" | [1] "ini" | [1] " ul" | [1] "com" | [1] "or " | [1] " es" |
| [1] " et" | [1] "nim" | [1] "ull" | [1] "omm" | [1] "r i" | [1] "ess" |
| [1] "et " | [1] "im " | [1] "lla" | [1] "mmo" | [1] " in" | [1] "sse" |
| [1] "t d" | [1] "m v" | [1] "lam" | [1] "mod" | [1] "in " | [1] "se " |
| [1] " do" | [1] " ve" | [1] "amc" | [1] "odo" | [1] "n r" | [1] "e c" |
| [1] "dol" | [1] "ven" | [1] "mco" | [1] "do " | [1] " re" | [1] " ci" |
| [1] "olo" | [1] "eni" | [1] "co " | [1] "o c" | [1] "rep" | [1] "cil" |
| [1] "lor" | [1] "nia" | [1] "o l" | [1] " co" | [1] "epr" | [1] "ill" |
| [1] "ore" | [1] "iam" | [1] " la" | [1] "con" | [1] "pre" | [1] "llu" |
| [1] "re " | [1] "am," | [1] "lab" | [1] "ons" | [1] "reh" | [1] "lum" |
| [1] "e m" | [1] "m, " | [1] "abo" | [1] "nse" | [1] "ehe" | [1] "um " |
| [1] " ma" | [1] ", q" | [1] "bor" | [1] "seq" | [1] "hen" | [1] "m d" |
| [1] "mag" | [1] " qu" | [1] "ori" | [1] "equ" | [1] "end" | [1] " do" |
| [1] "agn" | [1] "qui" | [1] "ris" | [1] "qua" | [1] "nde" | [1] "dol" |
| [1] "gna" | [1] "uis" | [1] "is " | [1] "uat" | [1] "der" | [1] "olo" |
| [1] "na " | [1] "is " | [1] "s n" | [1] "at." | [1] "eri" | [1] "lor" |
| [1] "a a" | [1] "s n" | [1] " ni" | [1] "t. " | [1] "rit" | [1] "ore" |
| [1] " al" | [1] " no" | [1] "nis" | [1] ". D" | [1] "it " | [1] "re " |
| [1] "ali" | [1] "nos" | [1] "isi" | [1] " Du" | [1] "t i" | [1] "e e" |
| [1] "liq" | [1] "ost" | [1] "si " | [1] "Dui" | [1] " in" | [1] " eu" |
| [1] "iqu" | [1] "str" | [1] "i u" | [1] "uis" | [1] "in " | [1] "eu " |
| [1] "qua" | [1] "tru" | [1] " ut" | [1] "is " | [1] "n v" | [1] "u f" |
| [1] "ua." | [1] "rud" | [1] "ut " | [1] "s a" | [1] " vo" | [1] " fu" |
| [1] "a. " | [1] "ud " | [1] "t a" | [1] " au" | [1] "vol" | [1] "fug" |
| [1] ". U" | [1] "d e" | [1] " al" | [1] "aut" | [1] "olu" | [1] "ugi" |
| [1] " Ut" | [1] " ex" | [1] "ali" | [1] "ute" | [1] "lup" | [1] "gia" |
| [1] "Ut " | [1] "exe" | [1] "liq" | [1] "te " | [1] "upt" | [1] "iat" |
| [1] "t e" | [1] "xer" | [1] "iqu" | [1] "e i" | [1] "pta" | [1] "at " |
| [1] " en" | [1] "erc" | [1] "qui" | [1] " ir" | [1] "tat" | [1] "t n" |
| [1] "eni" | [1] "rci" | [1] "uip" | [1] "iru" | [1] "ate" | [1] " nu" |
| [1] "nim" | [1] "cit" | [1] "ip " | [1] "rur" | [1] "te " | [1] "nul" |
| [1] "im " | [1] "ita" | [1] "p e" | [1] "ure" | [1] "e v" | [1] "ull" |
| [1] "m a" | [1] "tat" | [1] " ex" | [1] "re " | [1] " ve" | [1] "lla" |

```
[1] "la "       [1] "upi"       [1] "ui "
[1] "a p"       [1] "pid"       [1] "i o"
[1] " pa"       [1] "ida"       [1] " of"
[1] "par"       [1] "dat"       [1] "off"
[1] "ari"       [1] "ata"       [1] "ffi"
[1] "ria"       [1] "tat"       [1] "fic"
[1] "iat"       [1] "at "       [1] "ici"
[1] "atu"       [1] "t n"       [1] "cia"
[1] "tur"       [1] " no"       [1] "ia "
[1] "ur."       [1] "non"       [1] "a d"
[1] "r. "       [1] "on "       [1] " de"
[1] ". E"       [1] "n p"       [1] "des"
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[1] "Exc"       [1] "pro"       [1] "ser"
[1] "xce"       [1] "roi"       [1] "eru"
[1] "cep"       [1] "oid"       [1] "run"
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[1] "pte"       [1] "den"       [1] "nt "
[1] "teu"       [1] "ent"       [1] "t m"
[1] "eur"       [1] "nt,"       [1] " mo"
[1] "ur "       [1] "t, "       [1] "mol"
[1] "r s"       [1] ", s"       [1] "oll"
[1] " si"       [1] " su"       [1] "lli"
[1] "sin"       [1] "sun"       [1] "lit"
[1] "int"       [1] "unt"       [1] "it "
[1] "nt "       [1] "nt "       [1] "t a"
[1] "t o"       [1] "t i"       [1] " an"
[1] " oc"       [1] " in"       [1] "ani"
[1] "occ"       [1] "in "       [1] "nim"
[1] "cca"       [1] "n c"       [1] "im "
[1] "cae"       [1] " cu"       [1] "m i"
[1] "aec"       [1] "cul"       [1] " id"
[1] "eca"       [1] "ulp"       [1] "id "
[1] "cat"       [1] "lpa"       [1] "d e"
[1] "at "       [1] "pa "       [1] " es"
[1] "t c"       [1] "a q"       [1] "est"
[1] " cu"       [1] " qu"       [1] "st "
[1] "cup"       [1] "qui"       [1] "t l"
[1] " la"
[1] "lab"
[1] "abo"
[1] "bor"
[1] "oru"
[1] "rum"
[1] "um."
Warning message:
In readLines("BIBD1.txt") : incomplete final line found on 'BIBD1.txt'
> |
```

# Practical 10

**Aim:** Write a program for measuring similarity among documents and detecting passages which have been reused.

**Installation of required packages before executing program:-**

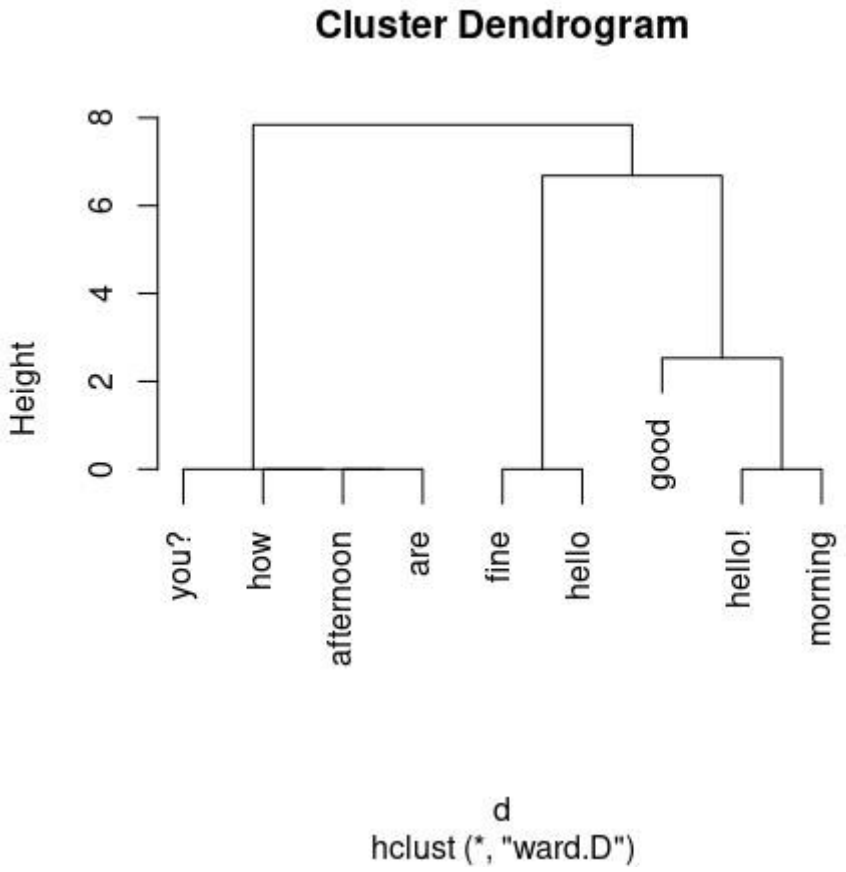
```
install.packages("tm")  require("tm")
install.packages("ggplot2")  install.packages("textreuse")
 install.packages("devtools")
```

**Source Code a**:-

```
 require("tm")
my.corpus<-Corpus(DirSource("files"))
my.corpus<-tm_map(my.corpus,removeWords,stopWords("english"))
my.tdm<-TermDocumentMatrix(my.corpus)
#inspect(my.tdm) my.dtm<-
DocumentTermMatrix(my.corpus,control=list(weighting=weightTfldf,stopw
ords=TRUE)) #inspect(my.dtm)
my.df<-as.data.frame(inspect(my.tdm)) my.df.scale<-scale(my.df)
d<-dist(my.df.scale,method = "euclidean")
fit<-hclust(d,method = "ward.D") plot(fit)
```

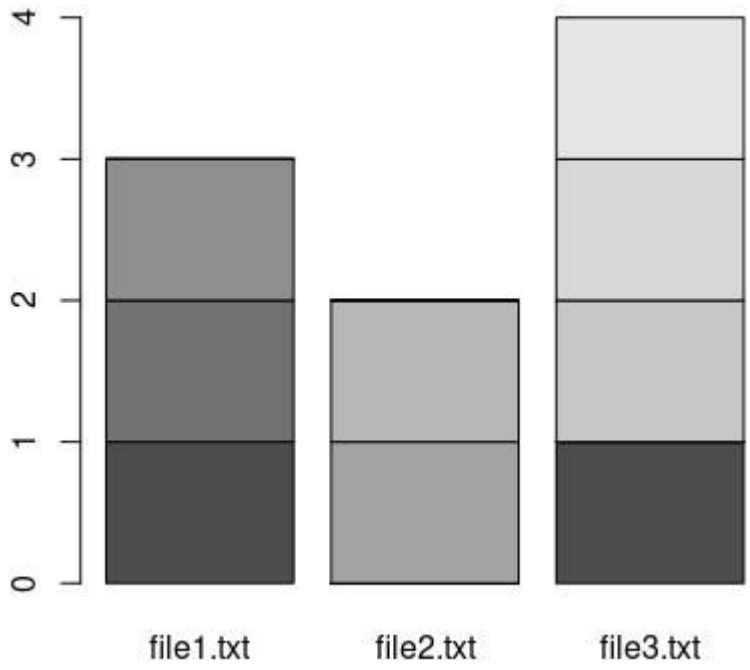
**Output:**

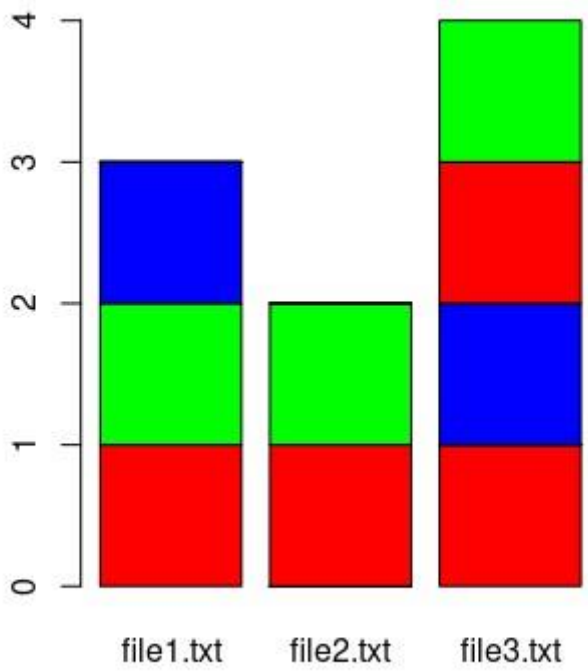
```
<<TermDocumentMatrix (terms: 9, documents: 3)>>
Non-/sparse entries: 10/17
Sparsity           : 63%
Maximal term length: 9
Weighting          : term frequency (tf)
Sample             :
           Docs
Terms       file1.txt file2.txt file3.txt
  afternoon         0         0         1
  are               0         0         1
  fine              0         1         0
  good              1         0         1
  hello             0         1         0
  hello!            1         0         0
  how               0         0         1
  morning           1         0         0
  you?              0         0         1
> my.df.scale<-scale(my.df)
> d<-dist(my.df.scale,method = "euclidean")
> fit<-hclust(d,method = "ward.D")
> plot(fit)
>
```



**Source code b (using bar plot with and without color):-** my.corpus<-Corpus(DirSource("/cloud/project/files")) my.corpus<-tm_map(my.corpus,removeWords,stopwords("english")) my.tdm<-TermDocumentMatrix(my.corpus) inspect(my.tdm) my.df<-as.data.frame(inspect(my.tdm)) barplot(as.matrix(my.tdm)) #barplot(as.matrix(my.tdm),col=color) barplot(as.matrix(my.tdm),col= c("Red","Green","Blue"))

**Output:**






**Source code c (using minhash and jaccard similarity):-** library("textreuse")

**Source Code**

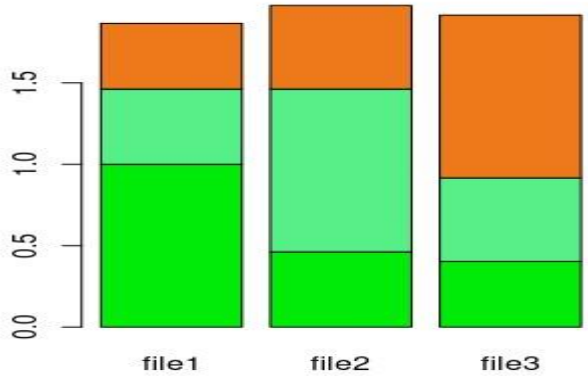
```
minhash <- minhash_generator(200, seed = 235)
ats <- TextReuseCorpus(dir = "files", tokenizer = tokenize_ngrams, n = 5,
minhash_func = minhash)

buckets <- lsh(ats, bands = 50, progress = interactive())
candidates <- lsh_candidates(buckets)
scores <- lsh_compare(candidates, ats, jaccard_similarity, progress = F)
scores

barplot(as.matrix(scores), col = c("#00eb07", "#57ef87", "#ed791a",
"#5e5fff", "#1cf1c6", "#5e035b"))
```

**Output:**

```
# A tibble: 3 × 3
  a     b     score
  <chr> <chr> <dbl>
1 file1 file2 0.462
2 file1 file3 0.403
3 file2 file3 0.513
```



# Practical 11

**Aim:** Write a java Program to demonstrate the k-moments for zeroth, first and second moments

## Input:

```
import java.io.*;
import java.util.*;

class KMoments
{
                        public static void main(String[] args)
                        {
                         int n = 15;
                         String stream[] =
{"a","b","c","b","d","a","c","d","a","b","d","c","a","a","b"};
                         int zerothMoment = 0, firstMoment = 0, secondMoment = 0,
count = 1, flag = 0;
                         ArrayList<Integer> arrayList = new ArrayList();

                         for(String character : stream)
                         {
                                System.out.print(character + "\t\t\t");
                         }
                         System.out.println();
                         Arrays.sort(stream);

                         for(int i = 1; i < n; i++)
                         {
                                if(stream[i] == stream[i - 1])
                                        count++;
                                else
                                {
                                        arrayList.add(count);
                                        count = 1;
                                }
                         }
```

```
                    arrayList.add(count);
                    System.out.println("Zeroth moment:\t\t\t" +
zerothMoment);

                    for(int i : arrayList)
                    {
                        firstMoment += i;
                        secondMoment += i * i;
                    }
 System.out.println("First Moment:\t\t\t" + firstMoment);
System.out.println("Second Moment:\t\t\t" + secondMoment);



                    }
}
```

## Output:

```
[Running] cd "c:\Users\USER\Downloads\" && javac KMoments.java && java KMoments
Note: KMoments.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
a          b          c          b          d          a          c          d          a          b          d          c          a          a          b
Zeroth moment:          0
First Moment:           15
Second Moment:          59

[Done] exited with code=0 in 13.622 seconds
```