Deepak.H

(192210627)

Day-1

1. The intervals and corresponding frequencies are as follows. age frequency

1-5. 200

5-15 450

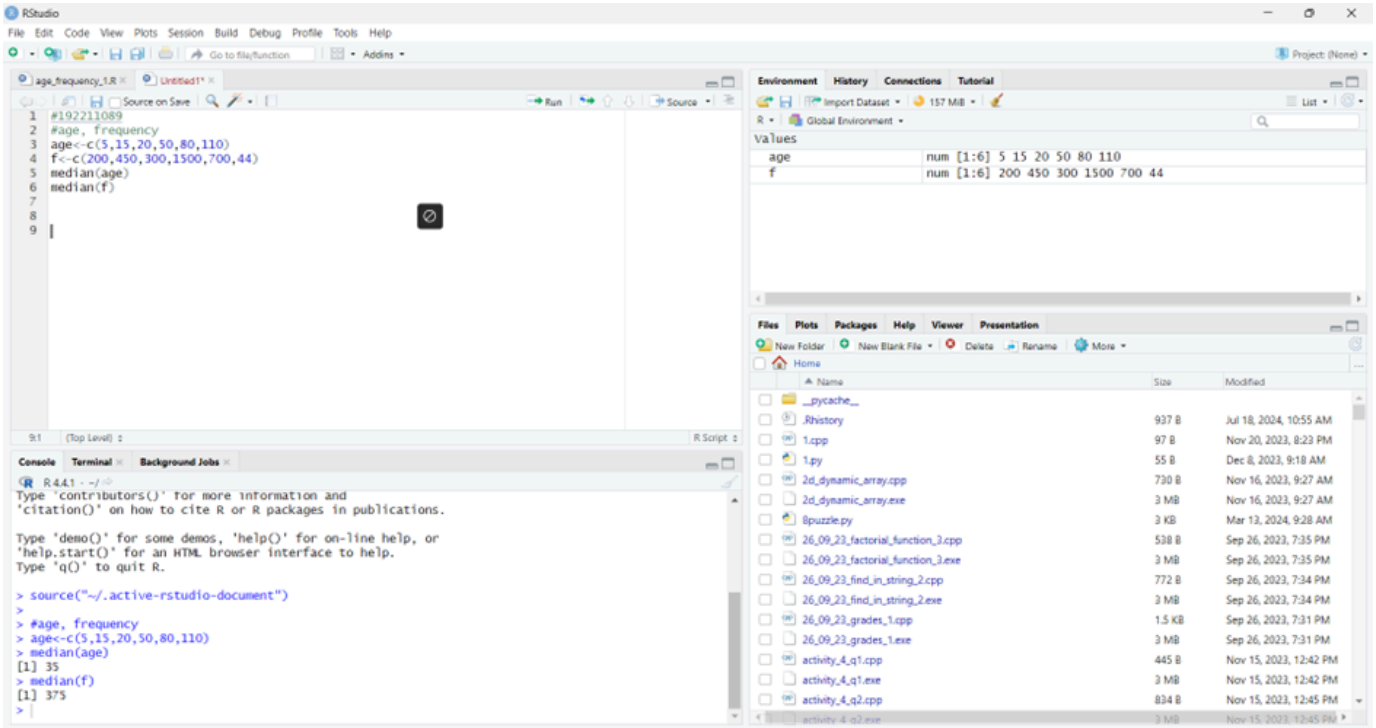
15-20 300

20-50 1500

50-80 700

80-110 44

Compute an approximate median value for the data



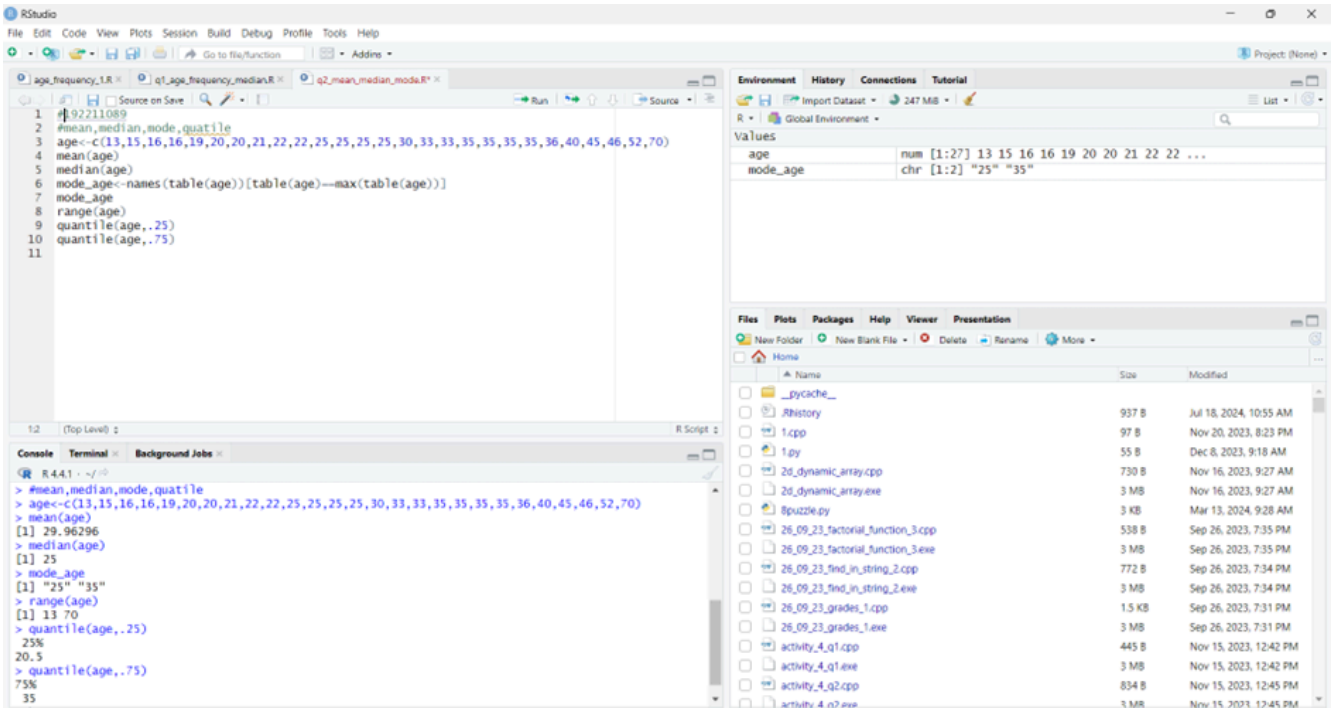
2. Suppose that the data for analysis includes the attribute age. The age values for the data tuples are (in increasing order) 13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.

(a) What is the mean of the data? What is the median?

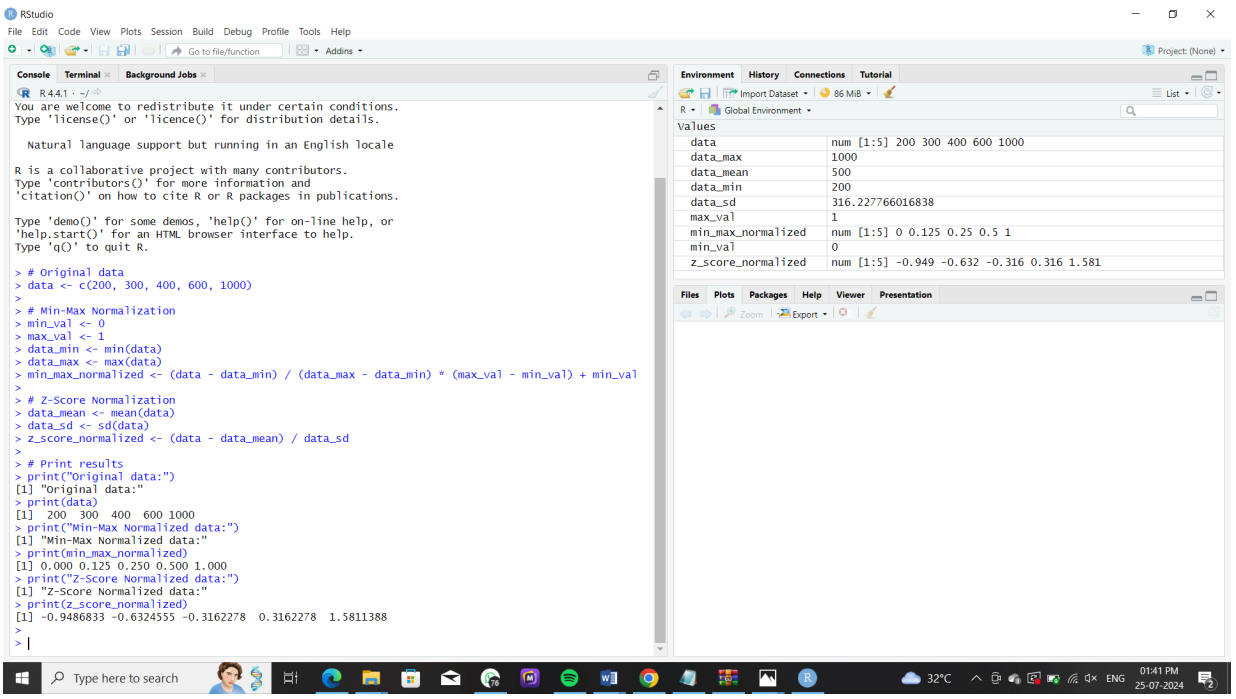
(b) What is the mode of the data? Comment on the data's modality (i.e., bimodal, trimodal, etc.).

(c) What is the midrange of the data?

(d) Can you find (roughly) the first quartile (Q1) and the third quartile (Q3) of the data?



3.Data Preprocessing: Reduction and Transformation Use the two methods below to normalize the following group of data: 200, 300, 400, 600, 1000 (a) min-max normalization by setting min = 0 and max = 1 (b) z-score normalization

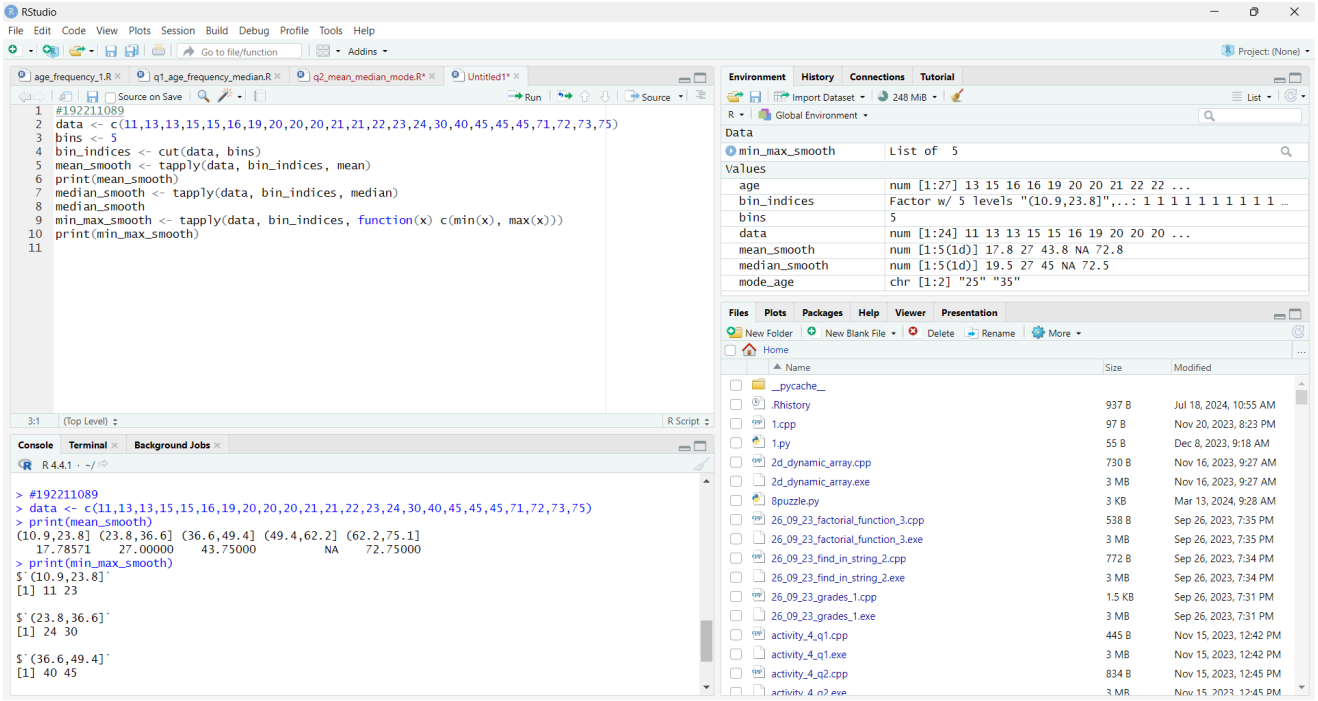


4.Data:11,13,13,15,15,16,19,20,20,20,21,21,22,23,24,30,40,45,45,45,71,72,73,75

a) Smoothing by bin mean

b) Smoothing by bin median

c) Smoothing by bin boundaries

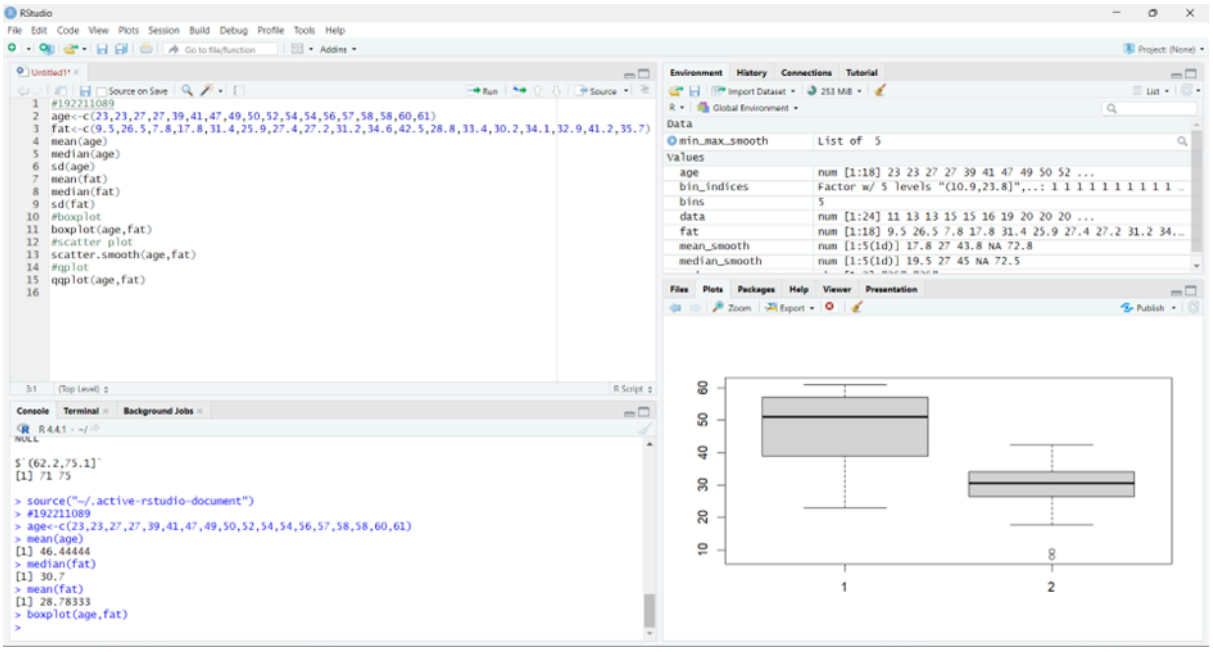


5. Suppose that a hospital tested the age and body fat data for 18 randomly selected adults with the following results:

(a) Calculate the mean, median, and standard deviation of age and %fat.

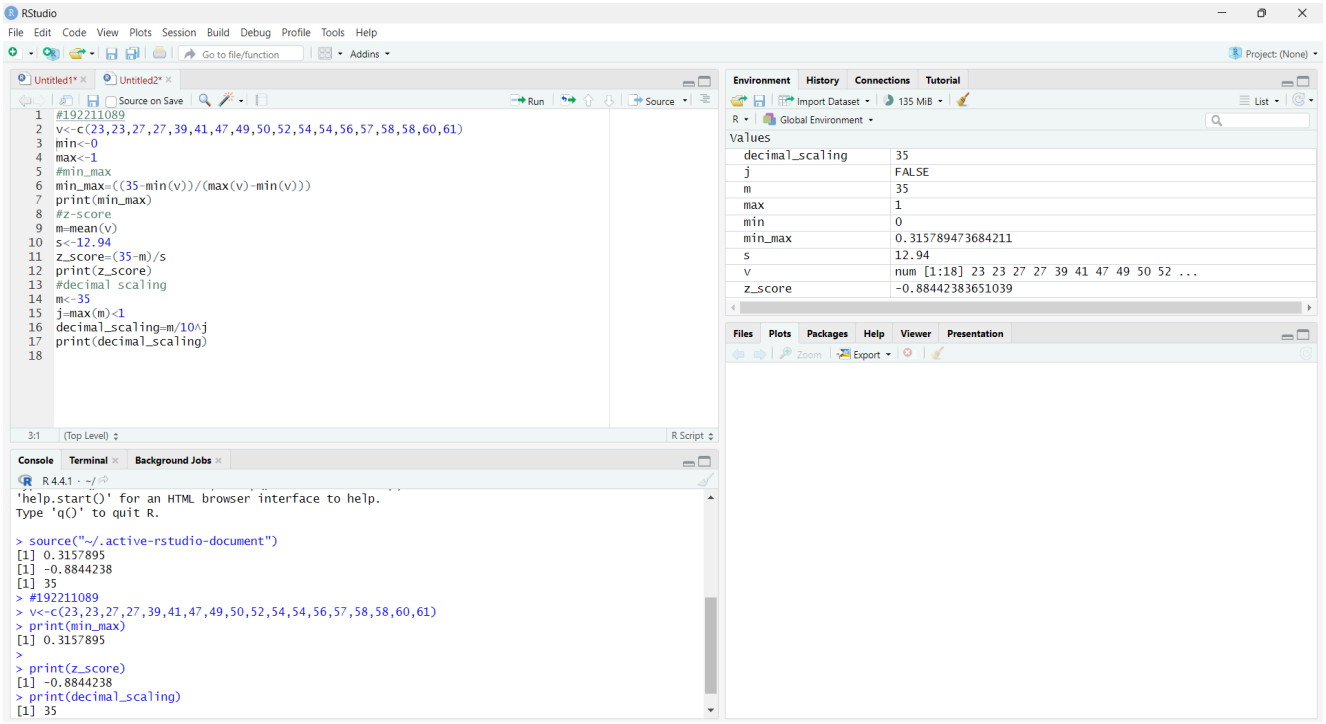
(b) Draw the boxplots for age and %fat.

(c) Draw a scatter plot and a q-q plot based on these two variables.



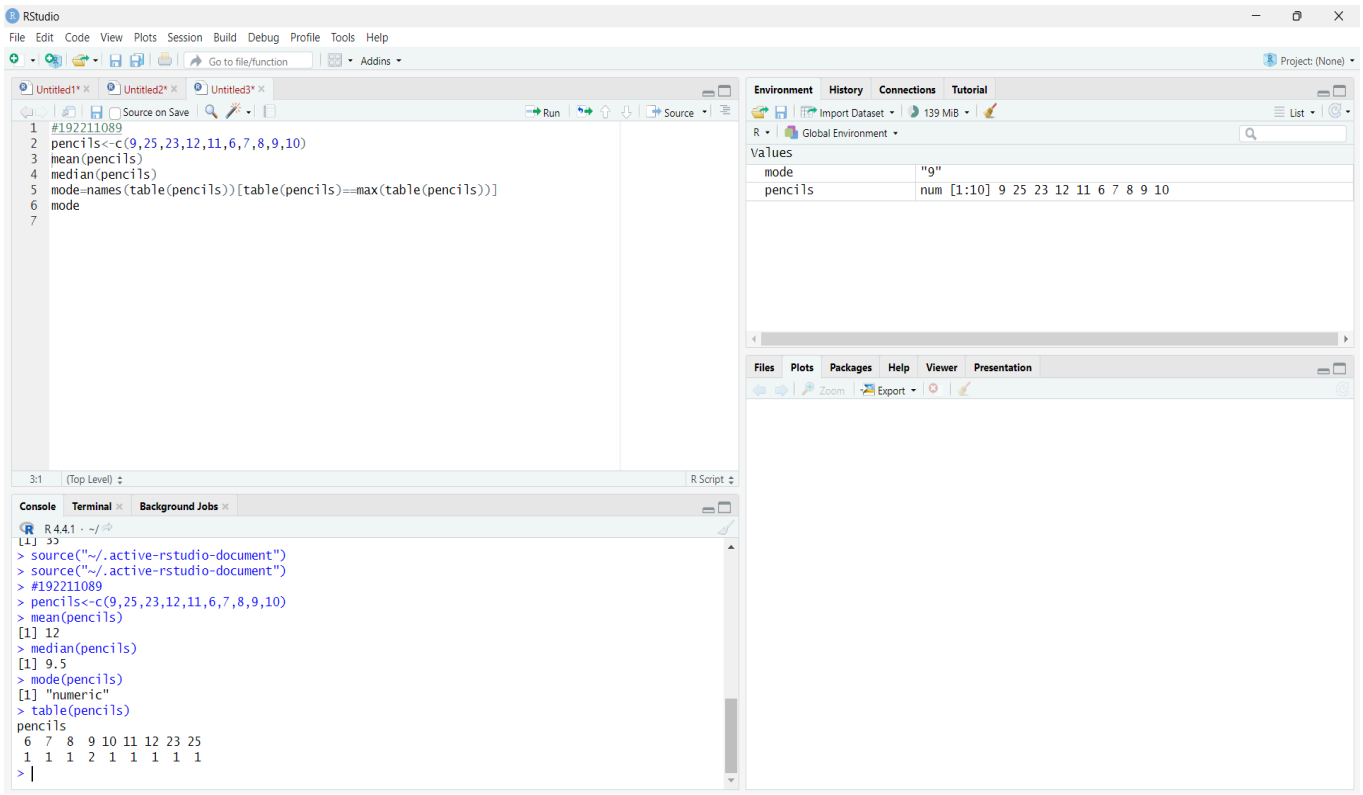
6. Suppose that a hospital tested the age and body fat data for 18 randomly selected adults with the following results:

(i) Use min-max normalization to transform the value 35 for age onto the range [0.0, 1.0].
(ii) Use z-score normalization to transform the value 35 for age, where the standard deviation of age is 12.94 years.
(iii) Use normalization by decimal scaling to transform the value 35 for age. Perform the above functions using R – tool



7. The following values are the number of pencils available in the different boxes. Create a vector and find out the mean, median and mode values of set of pencils in the given data.

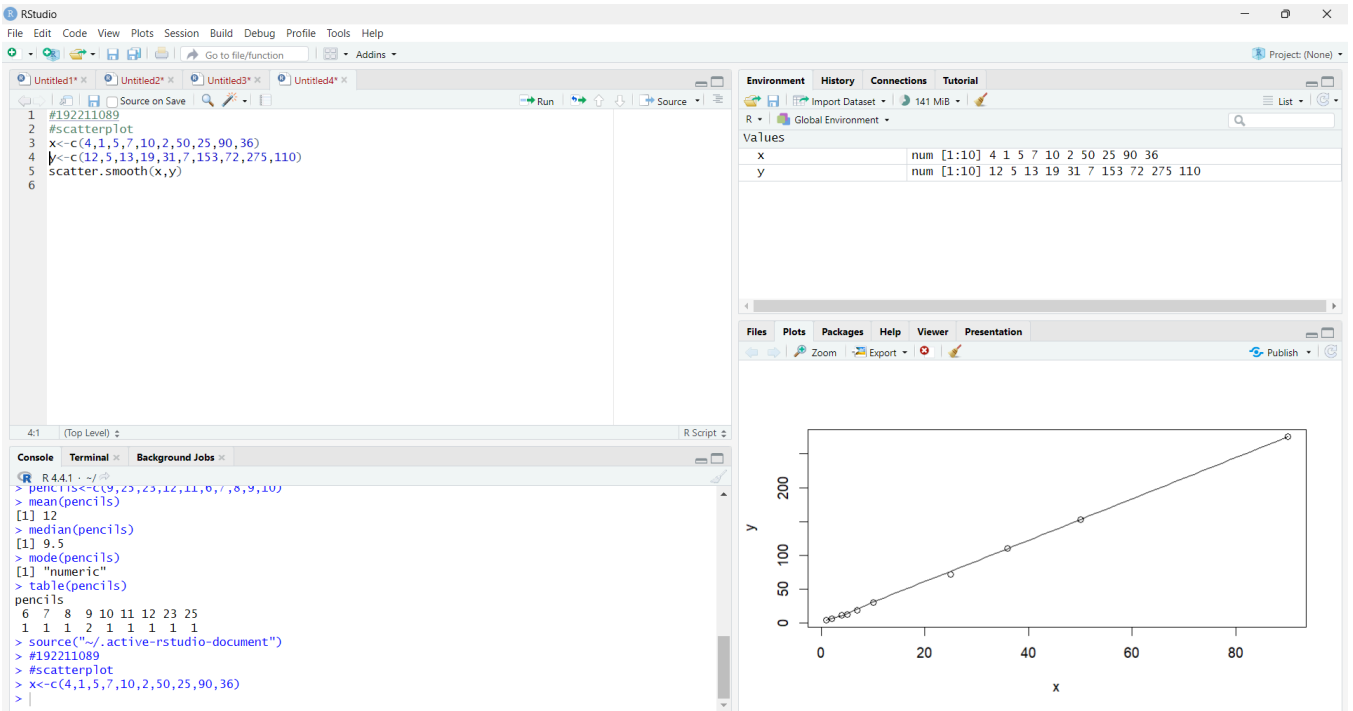
Box1	Box2	Box3	Box4	Box5	Box6	Box7	Box8	Box9	Box 10
9	25	23	12	11	6	7	8	9	10



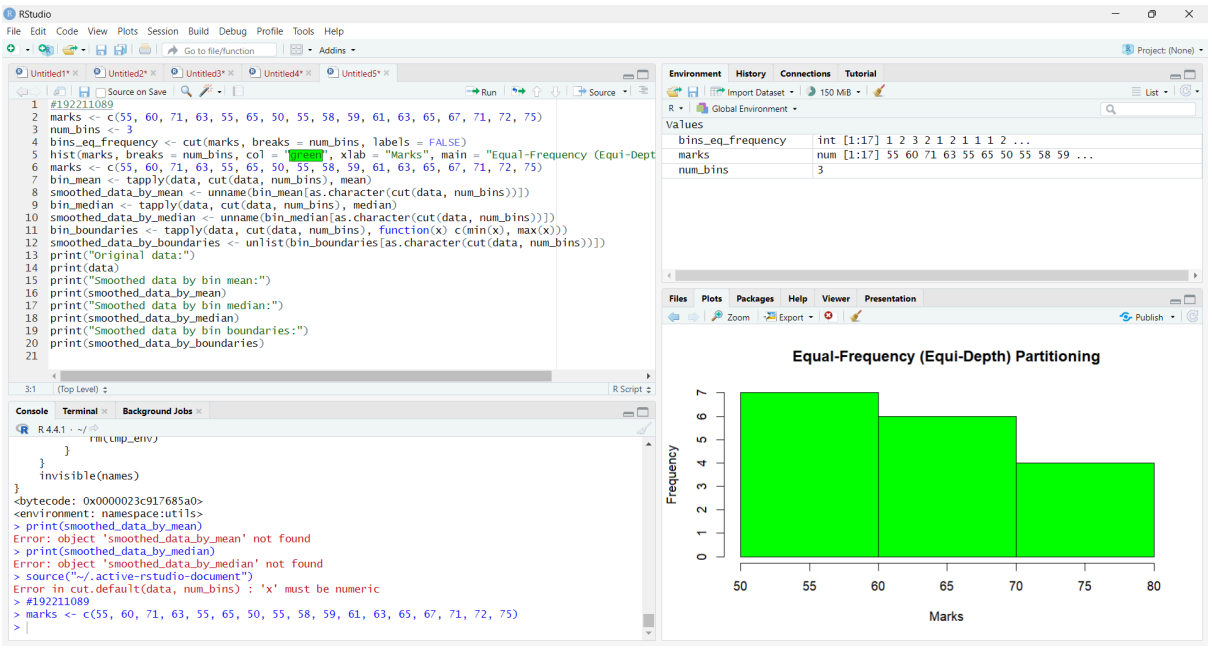
8. The following table would be plotted as (x,y) points, with the first column being the x values as several mobile phones sold and the second column being the y values as money. To use the scatter plot for how many mobile phones are sold.

x:4 1 5 7 10 2 50 25 90 36

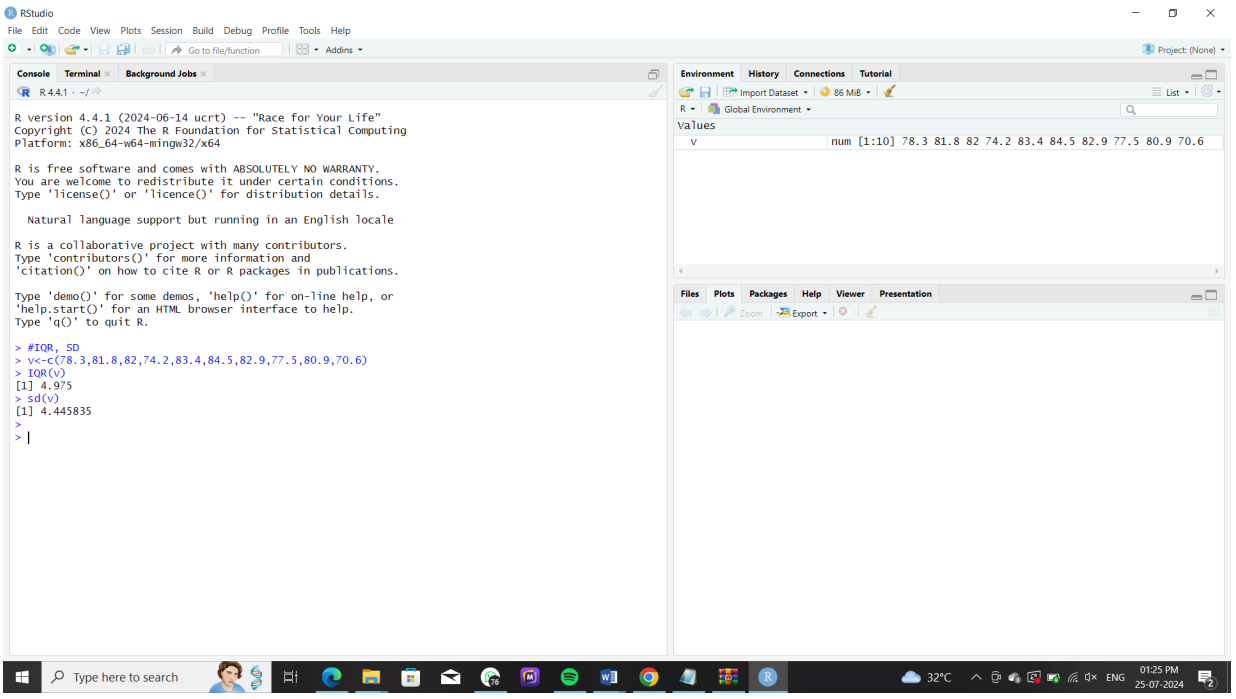
y:12 5 13 19 31 7 153 72 275 110



9. Implementing the R script using marks scored by a student in his model exam has been sorted as follows: 55, 60, 71, 63, 55, 65, 50, 55,58,59,61,63,65,67,71,72,75. They are partitioned into three bins using each of the following methods. Plot the data points using the histogram.a) equal-frequency (equi-depth) partitioning (b) equal-width partitioning

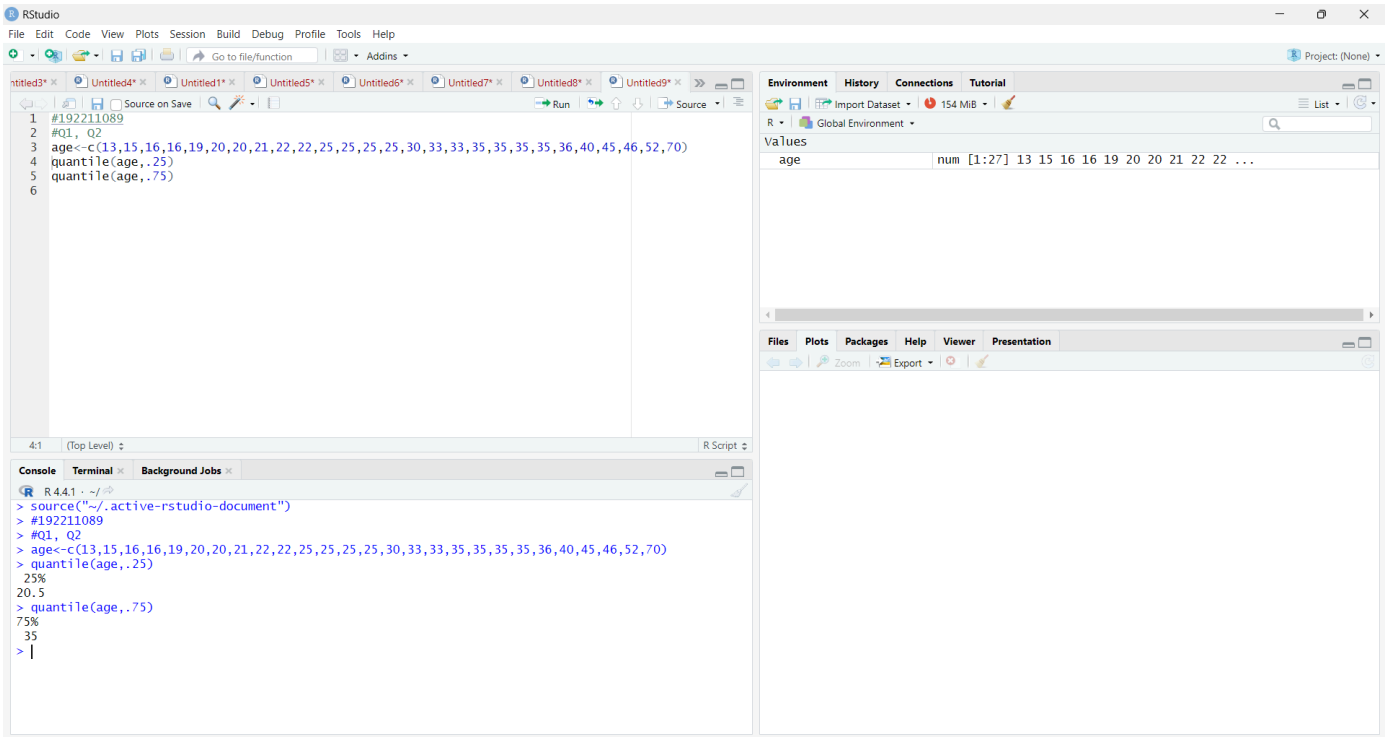


10. Suppose that the speed car is mentioned in different driving style.Regular 78.3 81.8 82 74.2 83.4 84.5 82.9 77.5 80.9 70.6 SpeedCalculate the Inter quantile and standard deviation of the given data.



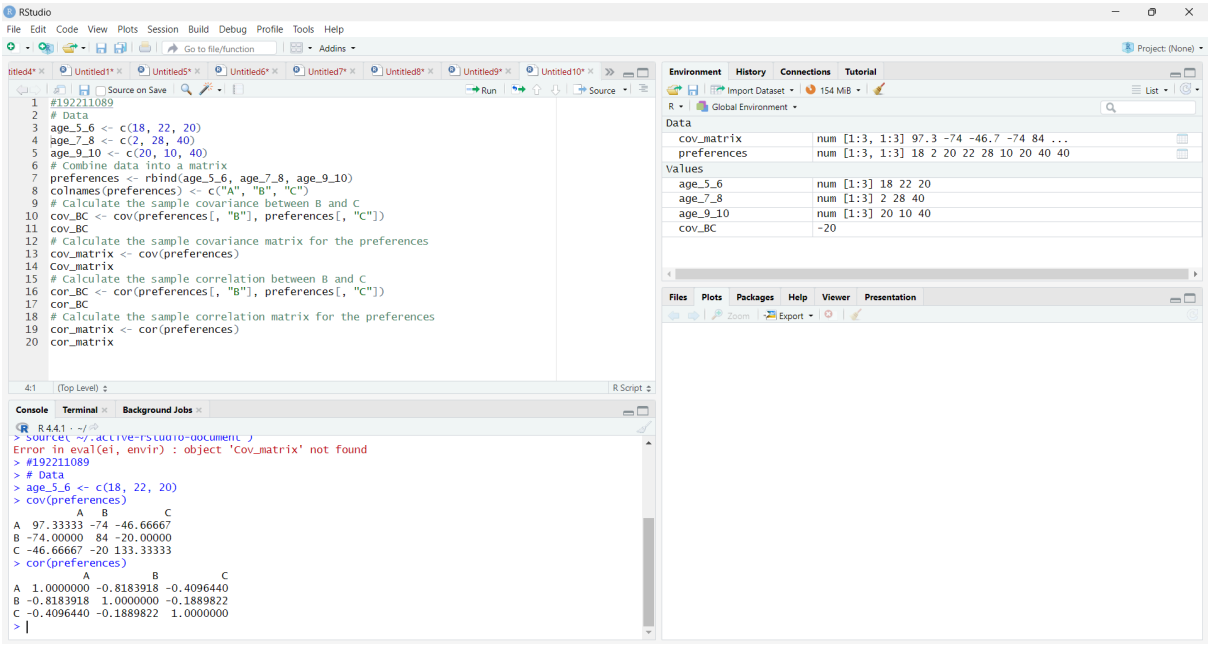
11. Suppose that the data for analysis includes the attribute age. The age values for the data tuples are (in increasing order) 13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.

Can you find (roughly) the first quartile (Q1) and the third quartile (Q3) of the data?

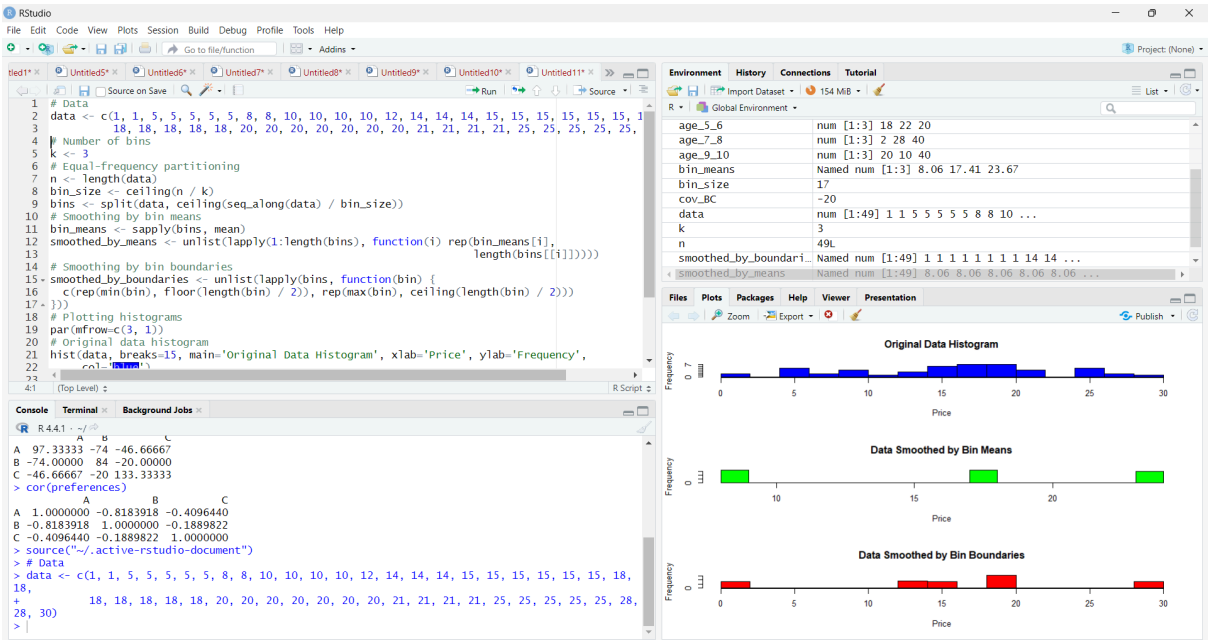


DAY - 2

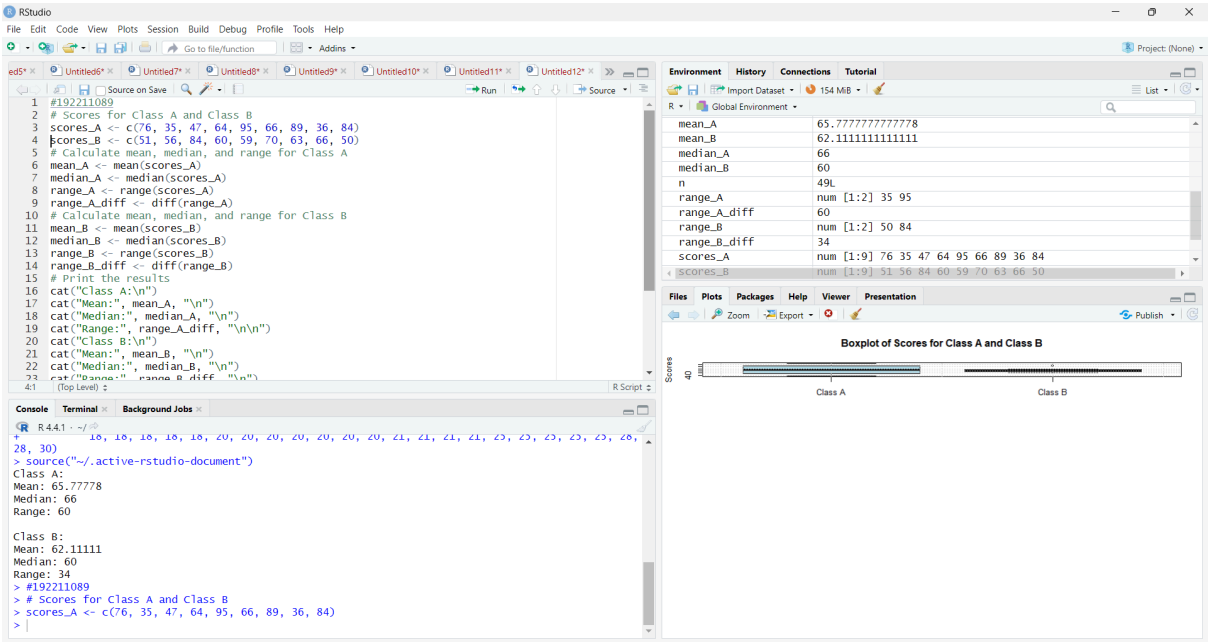
1.Covariance and correlation Children of three ages are asked to indicate their preference
for three photographs of adults. Do the data suggest that there is a significant relationship
between age and photograph preference? What is wrong with this study? Photograph: Age
of child A B C 5-6 years: 18 22 20 7-8 years: 2 28 40 9-10 years: 20 10 40
1.Use cov() to calculate the sample covariance between B and C.
2. Use another call to cov() to calculate the sample covariance matrix for the preferences.
3. Use cor() to calculate the sample correlation between B and C.
4. Use another call to cor() to calculate the sample correlation matrix for the



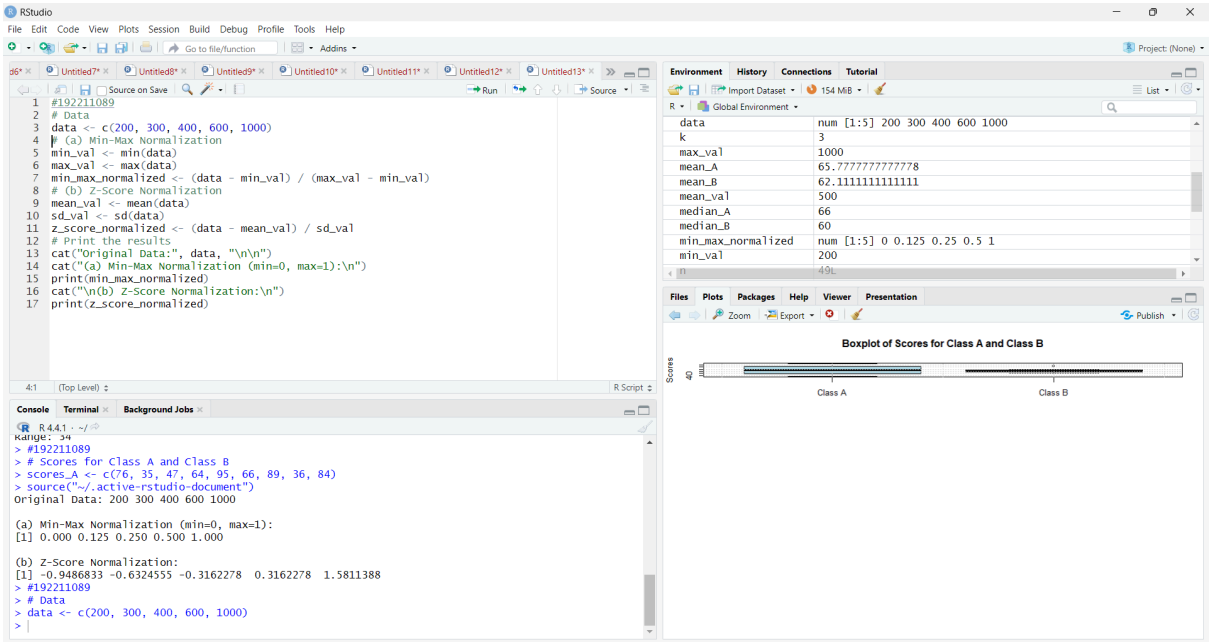
2. Imagine that you have selected data from the All Electronics data warehouse for analysis.
The data set will be huge! The following data are a list of All Electronics prices for commonly
sold items (rounded to the nearest dollar). The numbers have been sorted: 1, 1, 5, 5, 5, 5, 5,
8, 8, 10, 10, 10, 10, 12, 14, 14, 14, 15, 15, 15, 15, 15, 15, 18, 18, 18, 18, 18, 8, 18, 20, 20, 20, 20, 20, 20, 20, 21, 21, 21, 21, 25, 25, 25, 25, 25, 28, 28, 30 the dataset using an equal-frequency partitioning method with bin equal to 3 (ii) apply data smoothing using bin
means and bin boundary. (iii) Plot Histogram for the above frequency division



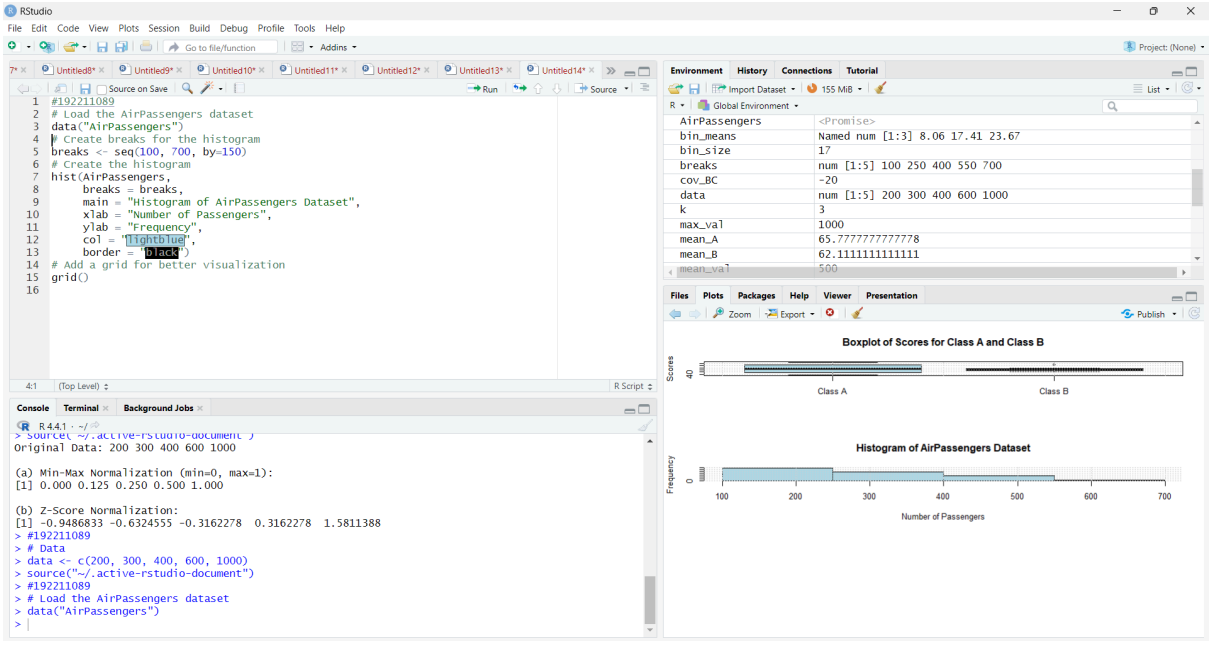
3. Two Maths teachers are comparing how their Year 9 classes performed in the end of
year exams. Their results are as follows: Class A: 76, 35, 47, 64, 95, 66, 89, 36, 8476,35,47,64,95,66,89,36,84 Class B: 51, 56, 84, 60, 59, 70, 63, 66, 5051,56,84,60,59,70,63,66,50 (i) Find which class had scored higher mean, median and
range. (ii) Plot above in boxplot and give the inferences Class B: 51, 56, 84, 60, 59, 70, 63,
66, 5051,56,84,60,59,70,63,66,50



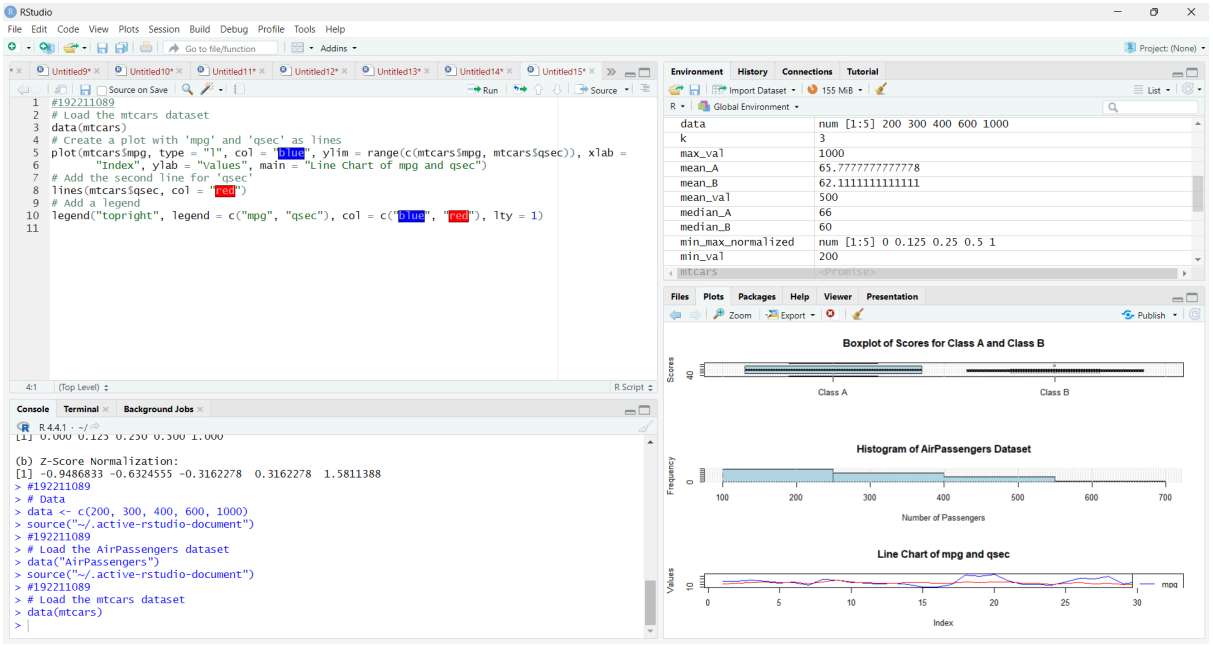
4. Let us consider one example to make the calculation method clear. Assume that the
minimum and maximum values for the feature F are $50,000 and $100,000 correspondingly.
It needs to range F from 0 to 1. By min-max normalization, v = $80, b) Use
the two methods below to normalize the following group of data: 200, 300, 400, 600, 1000
(a) min-max normalization by setting min = 0 and max = 1 (b) z-score normalization



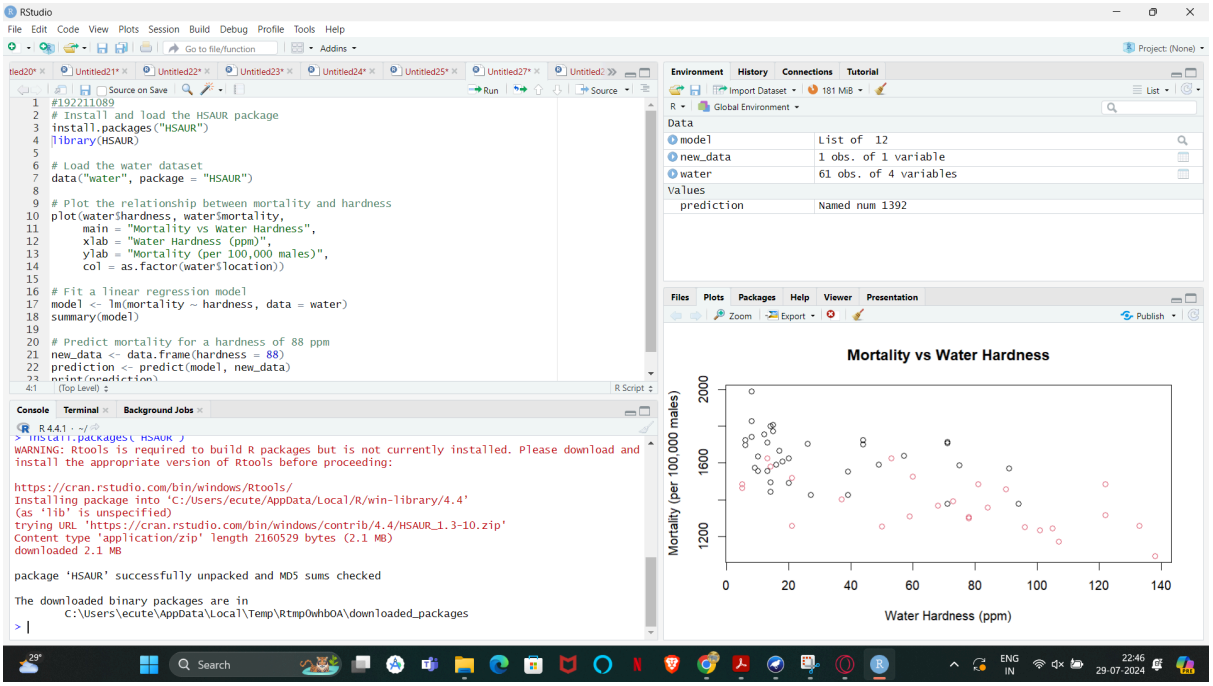
5. Make a histogram for the “AirPassengers “dataset, starting at 100 on the x-axis, and from
values 200 to 700, make the bins 150 wide



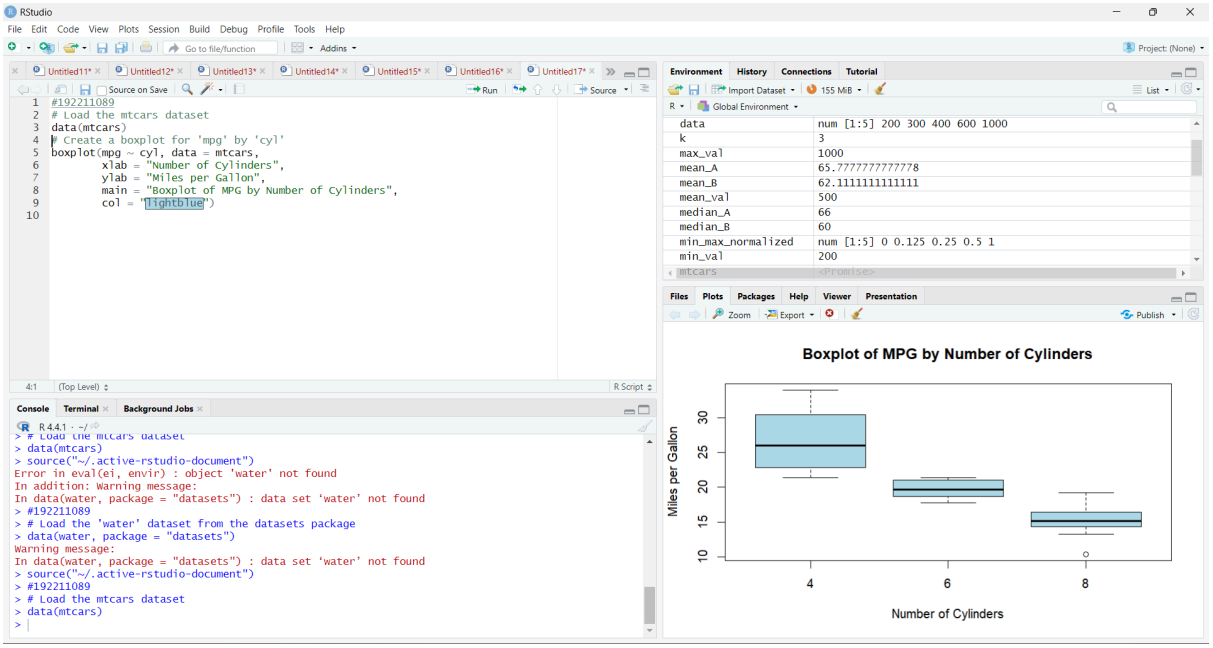
6. Obtain Multiple Lines in a Line Chart using a single Plot Function in Use attributes“mpg” and“sec” of the dataset “mtcars”
Code:



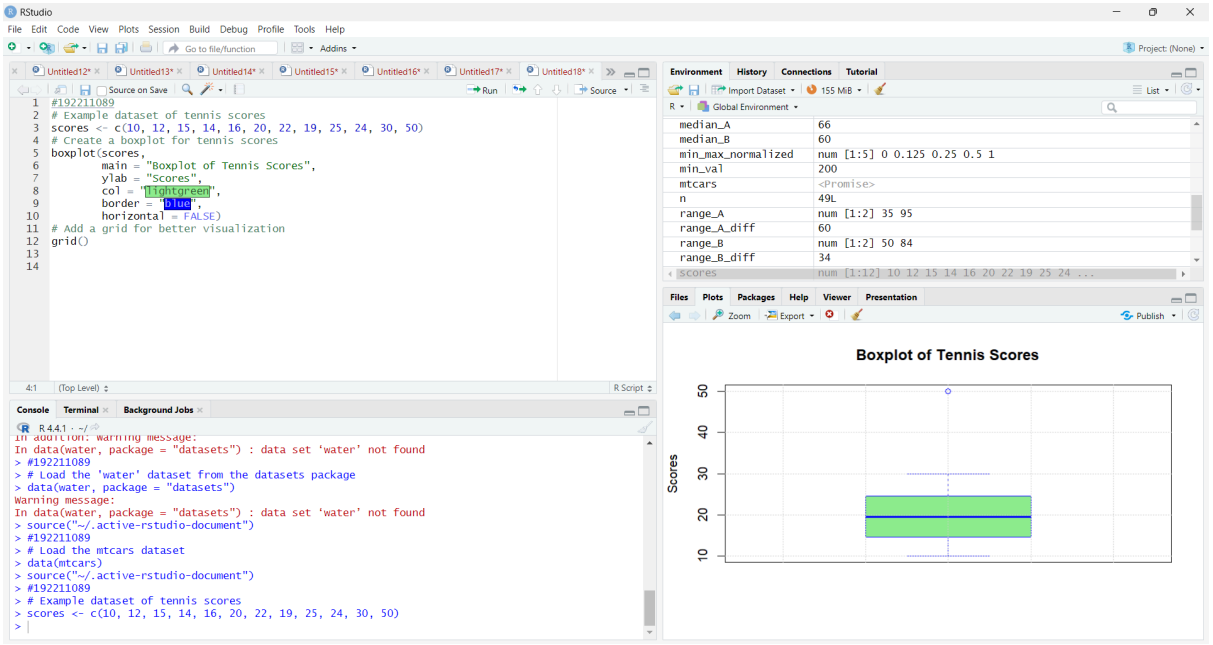
7. Download the Dataset "water" From the R dataset Link. Find out whether there is a linear relation between attributes"mortality" and"hardness" by plot function.Fit



8.Create a Boxplot graph for the relation between "mpg"(miles per gallon) and "cyl"(number
of Cylinders) for the dataset "mtcars" available in R Environment
Code:

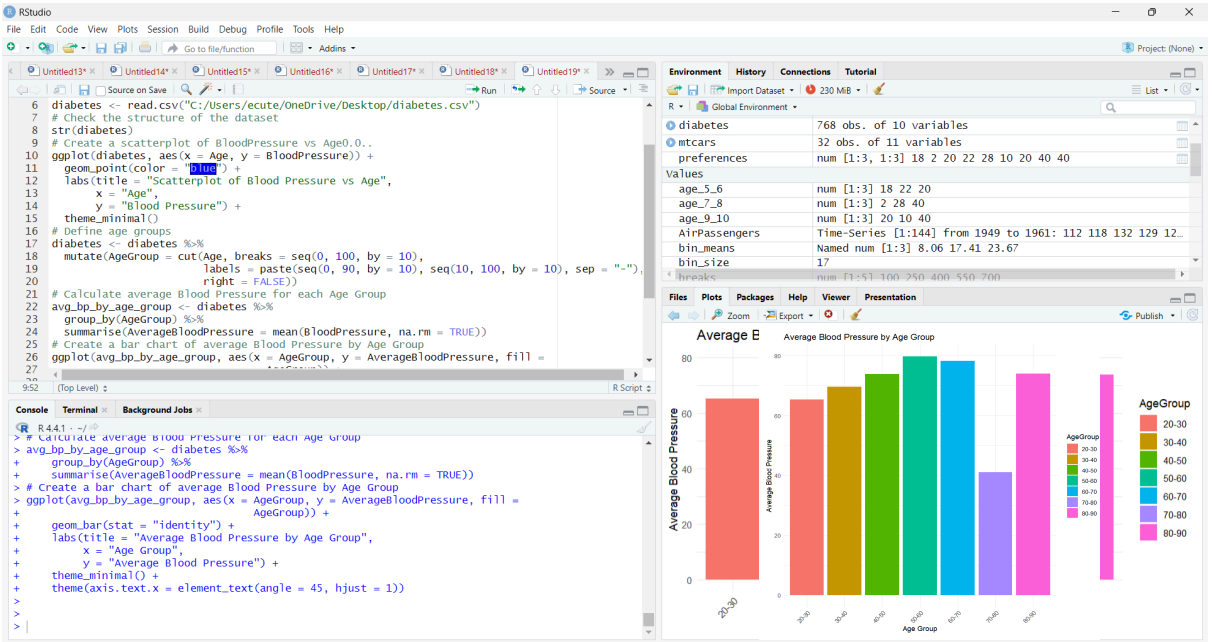


9. Assume the Tennis coach wants to determine if any of his team players are scoring outliers. To visualize the distribution of points scored by his players, then how can he decide to develop the box plot? Give a suitable example using the Boxplot visualization technique.
Code:



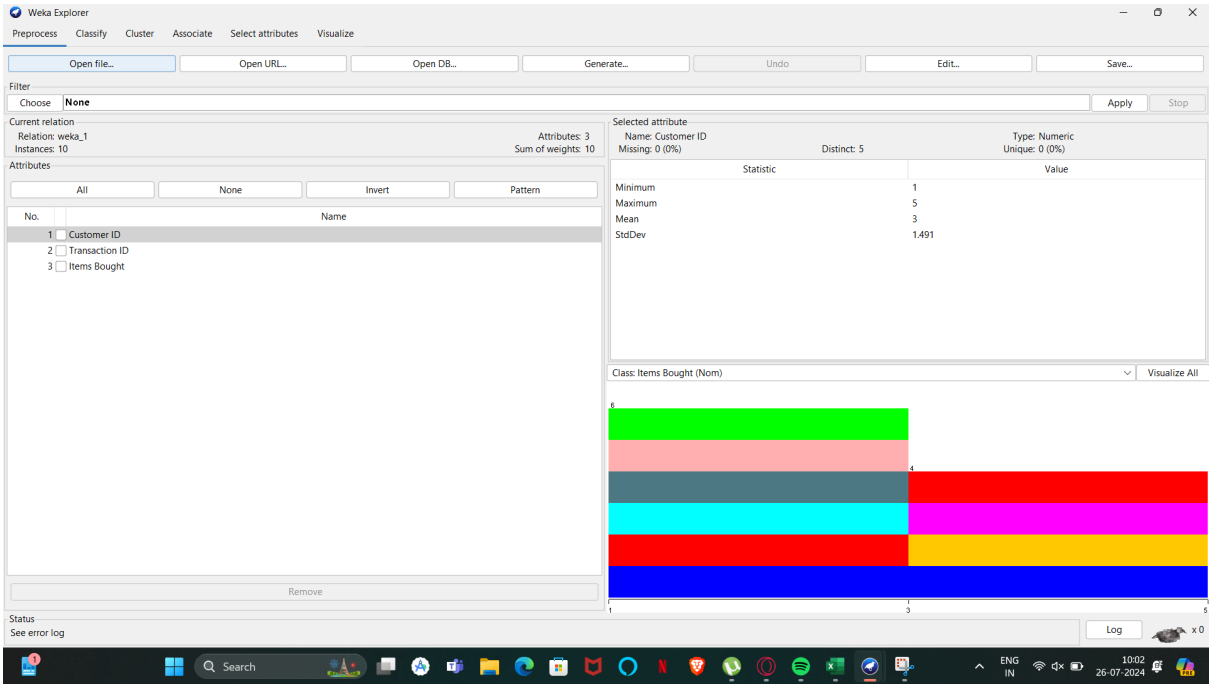
10. Implement using R language in which age group of people are affected byblood pressurebased on the diabetes dataset show it using scatterplot and bar chart (that is BloodPressurevs Age using dataset “diabetes.csv”)

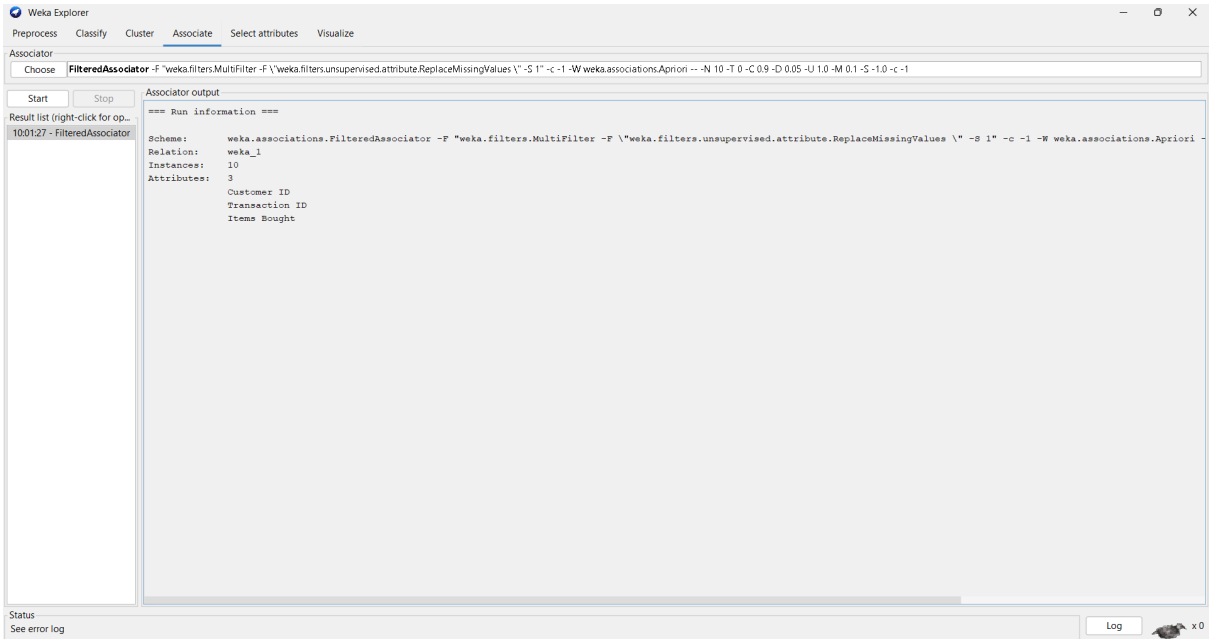
Code:



Day - 3

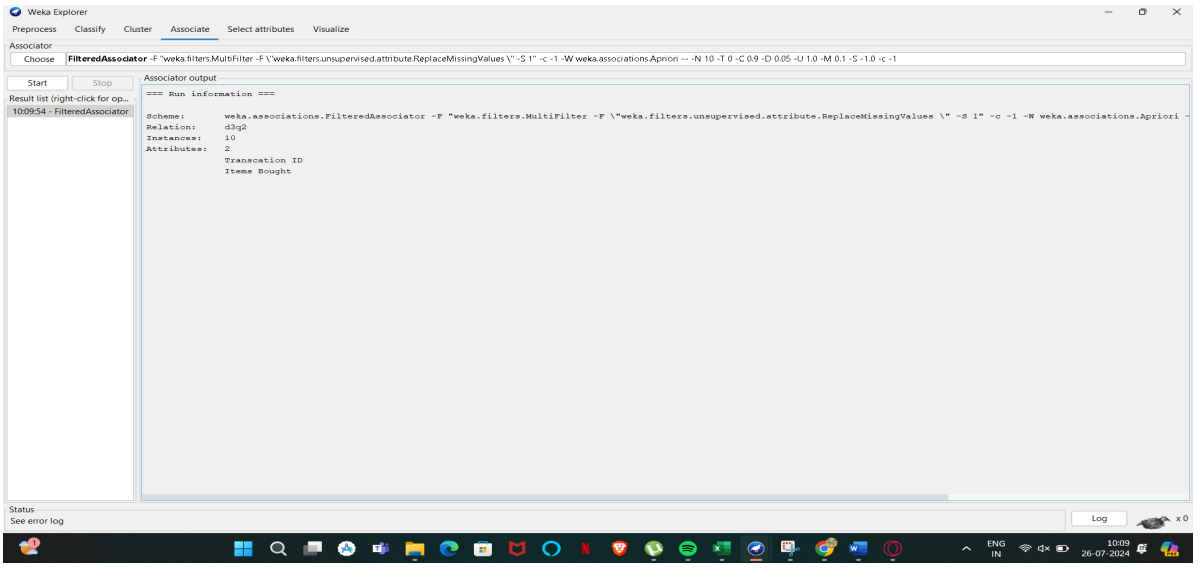
1. Consider the data set and perform the Apriori Algorithm and FP algorithm support:3 and confidence=50%

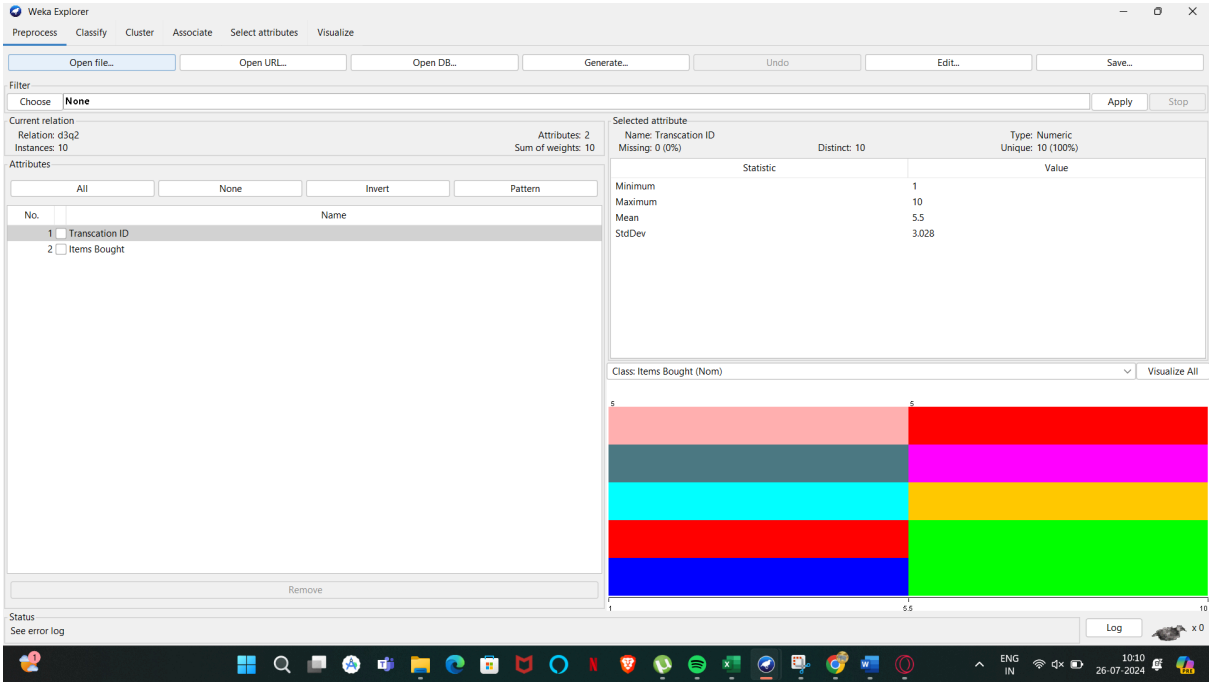




2.

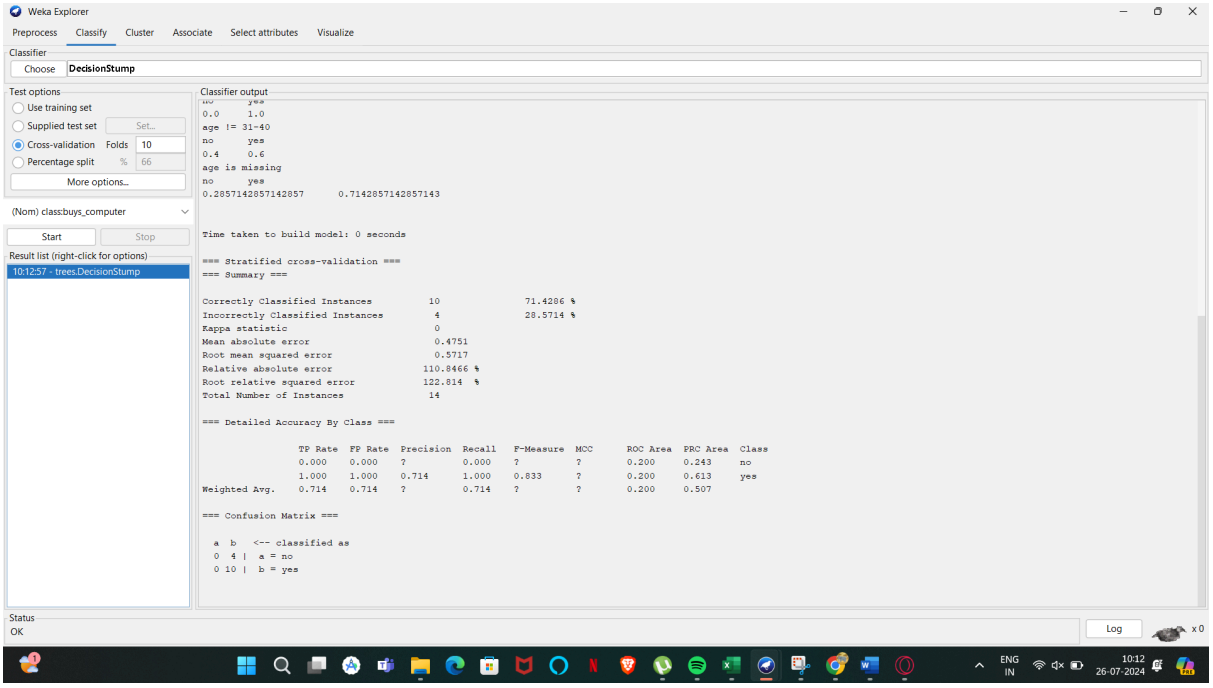
Transaction ID	Items Bought
1	{Milk, Beer, Diapers}
2	{Bread, Butter, Milk}
3	{Milk, Diapers, Cookies}
4	{Bread, Butter, Cookies}
5	{Beer, Cookies, Diapers}
6	{Milk, Diapers, Bread, Butter}
7	{Bread, Butter, Diapers}
8	{Beer, Diapers}
9	{Milk, Diapers, Bread, Butter}
10	{Beer, Cookies}

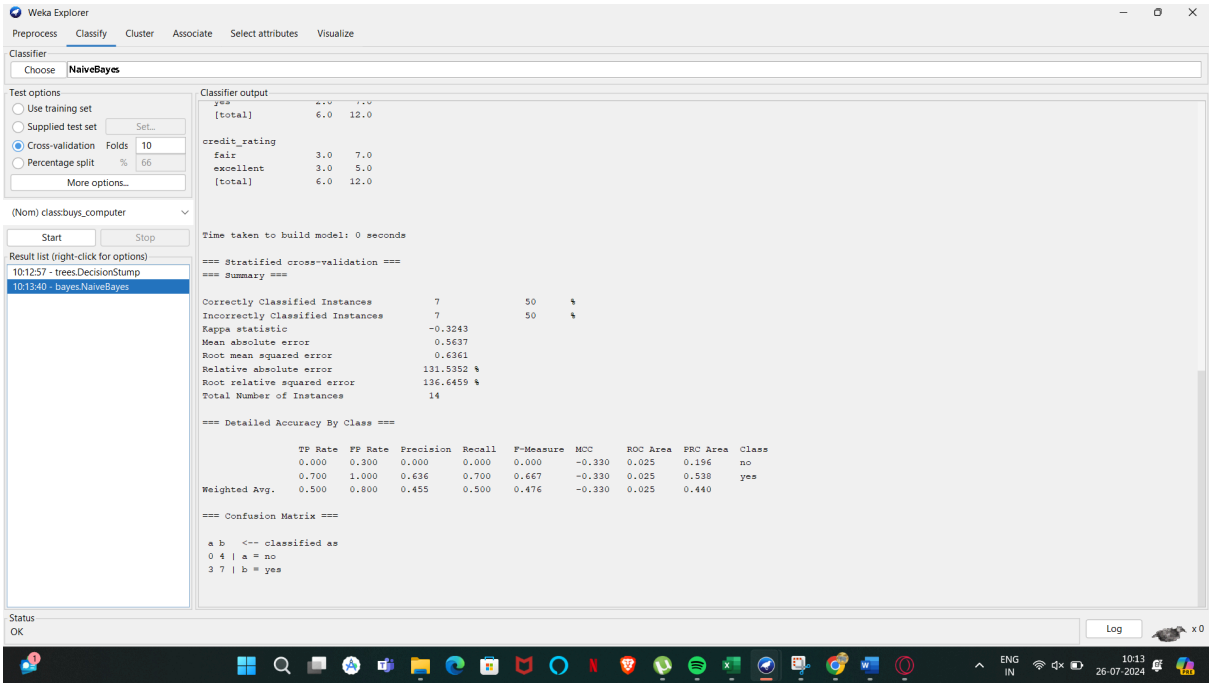




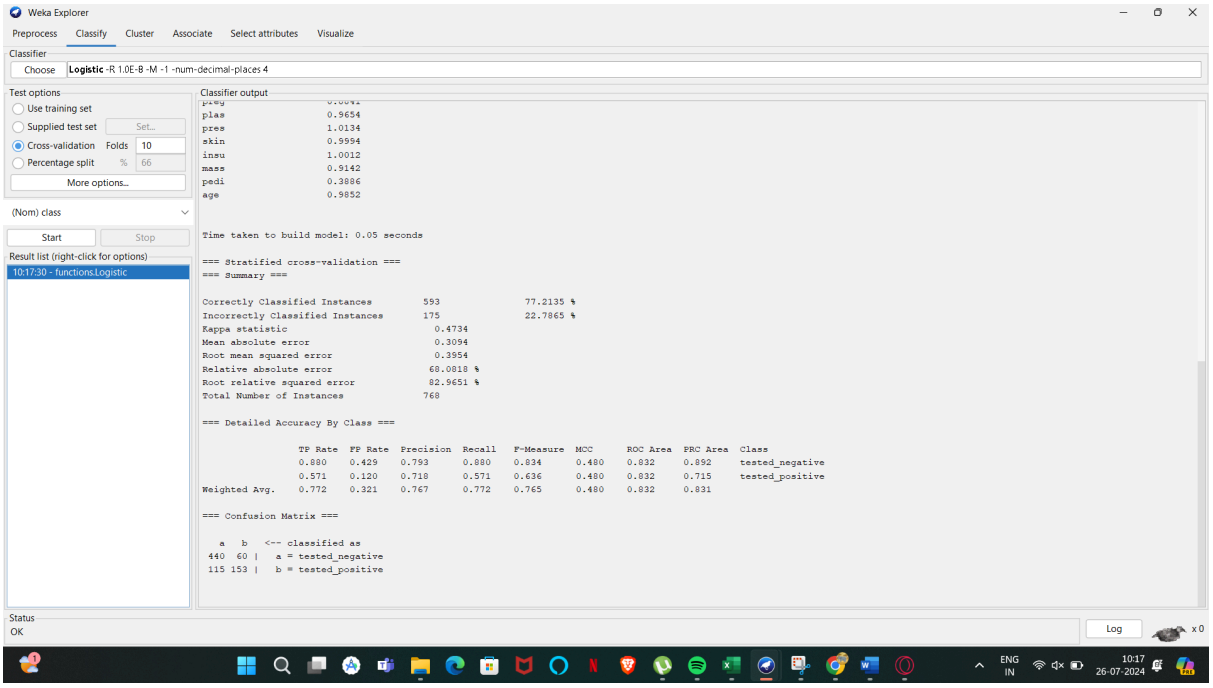
3.

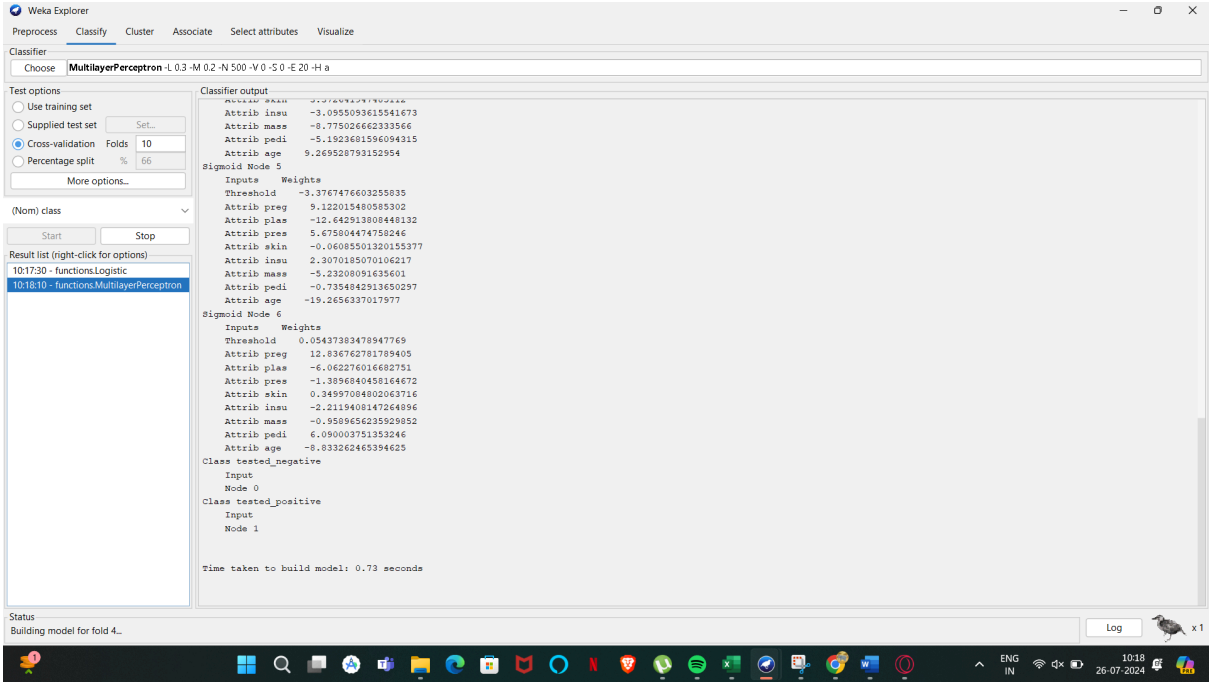
RID	age	income	student	credit_rating	Class: buys_computer
1	<=30	high	no	fair	no
2	<=30	high	no	excellent	no
3	31 . . . 40	high	no	fair	yes
4	>40	medium	no	fair	yes
5	>40	low	yes	fair	yes
6	>40	low	yes	excellent	no
7	31 . . . 40	low	yes	excellent	yes
8	<=30	medium	no	fair	no
9	<=30	low	yes	fair	yes
10	>40	medium	yes	fair	yes
11	<=30	medium	yes	excellent	yes
12	31 . . . 40	medium	no	excellent	yes
13	31 . . . 40	high	yes	fair	yes
14	>40	medium	no	excellent	no





4.Analysis the dataset “diabetes. csv” how the diabetes trend is for different age people, using linear regression and multiple regression.





5.Implement using WEKA for the given Suppose a database has five transactions. Let min sup= 50%(2) and min con f = 80%.

Transactions	Items
T1	(M, O, N, K, E, Y)

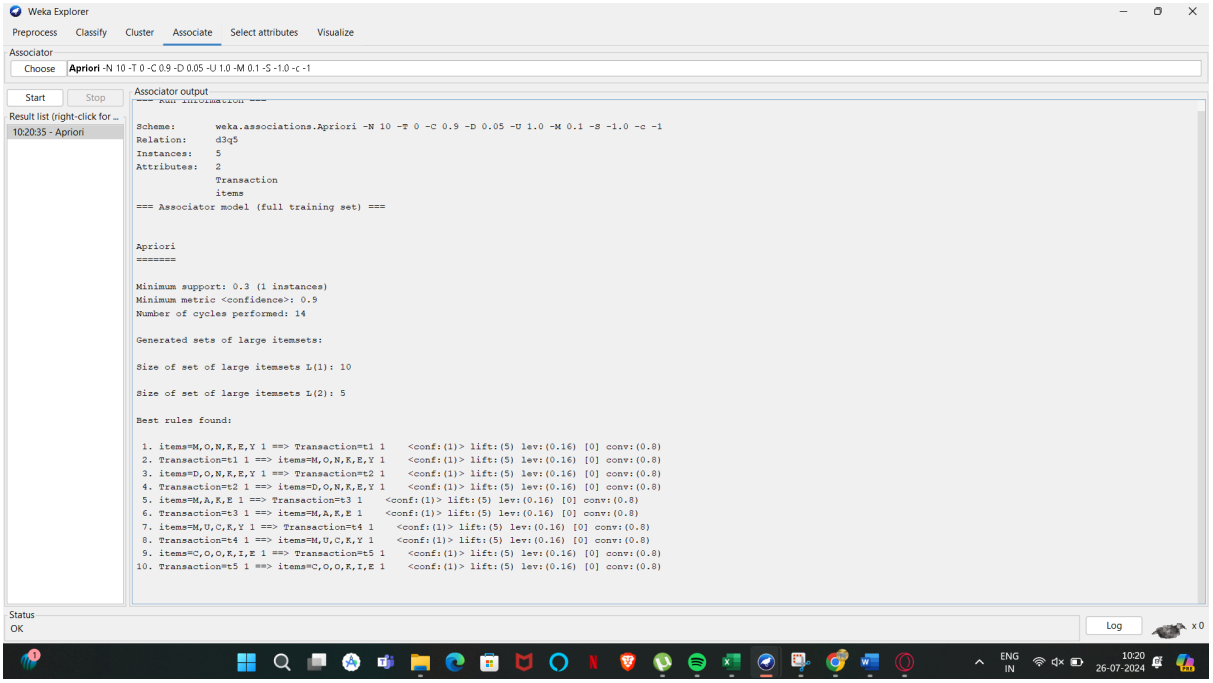
T2 **(D, O, N, K, E, Y)**

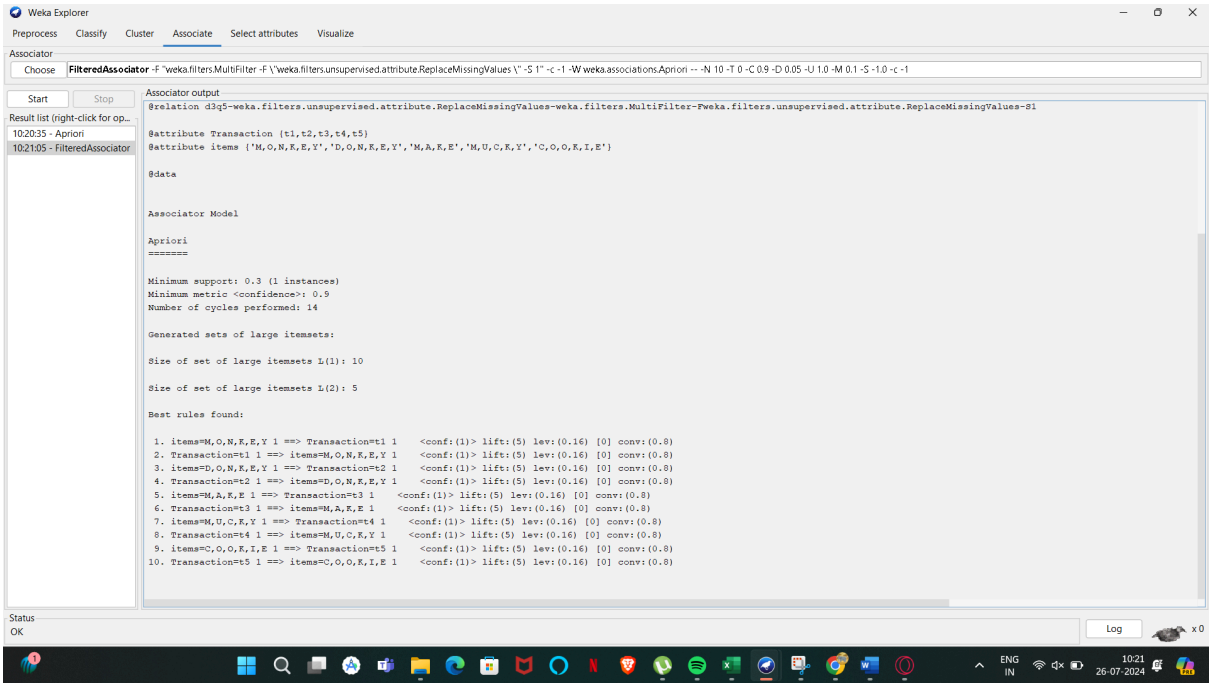
T3 **(M, A, K, E)**

T4 **(M, U, C, K, Y)**

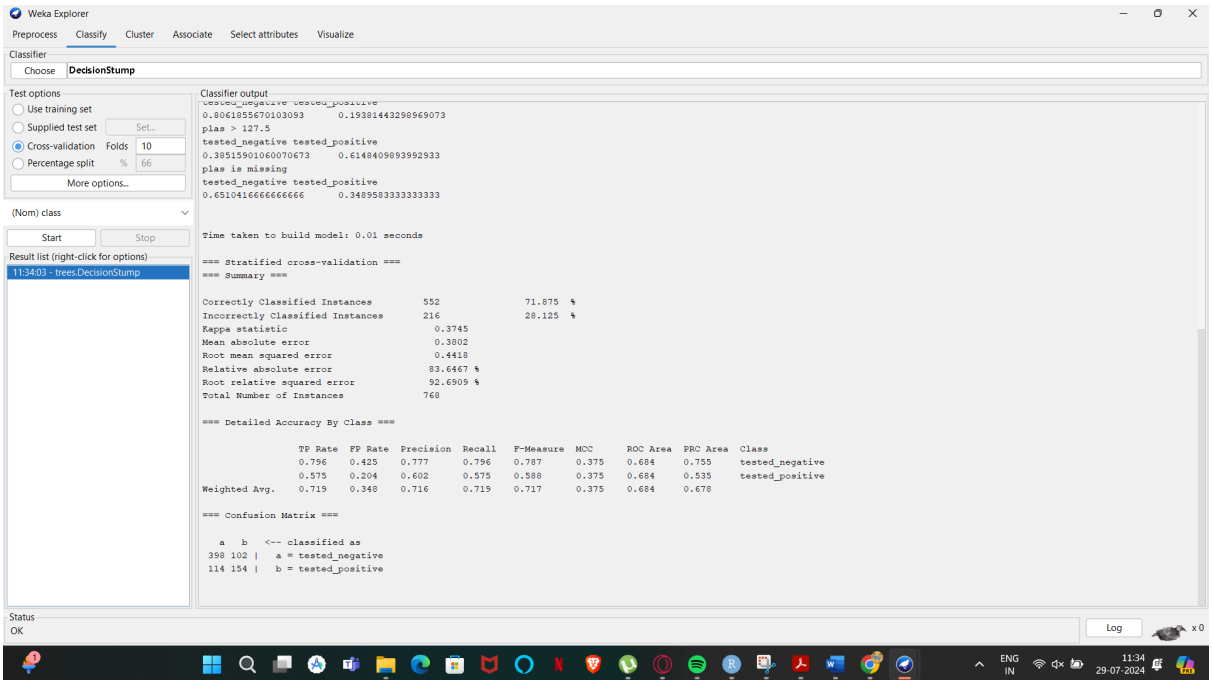
T5 **(C,O, O, K, I ,E)**

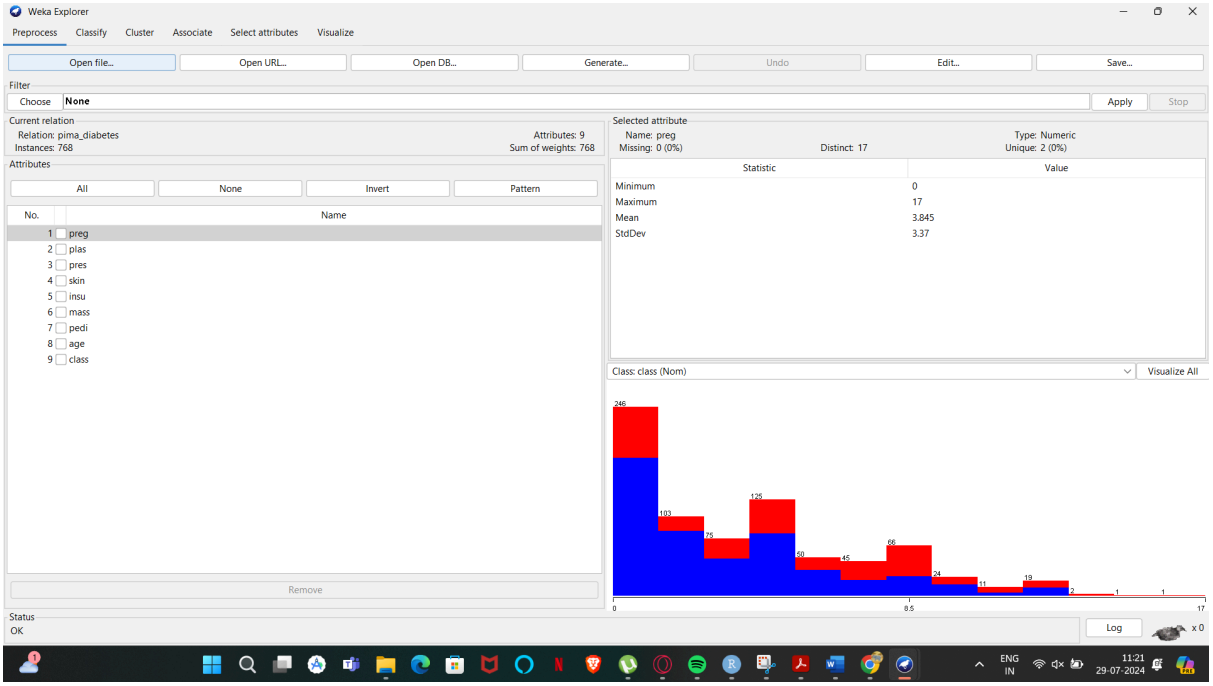
- **Find all frequent item sets using Apriori algorithm**
- **Also draw FP-Growth Tree**

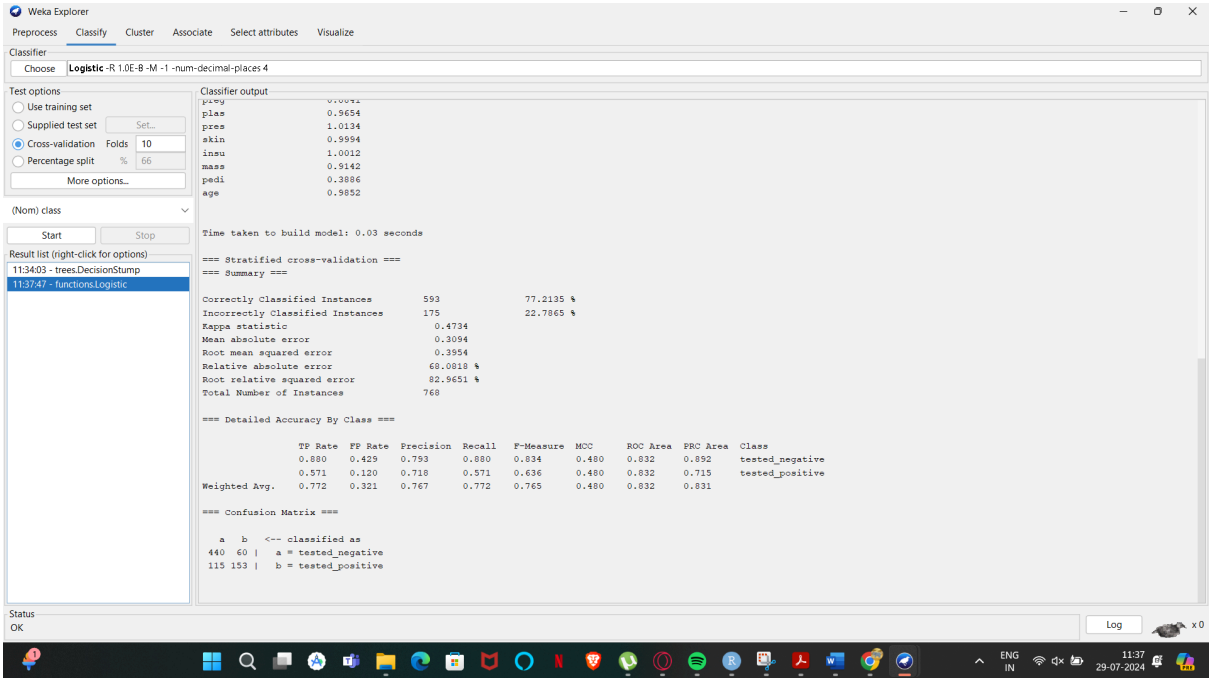




6. Prediction of Categorical Data using Decision Tree Algorithm through WEKA using any datasets. a) Tree b) Preprocess c) Logistic



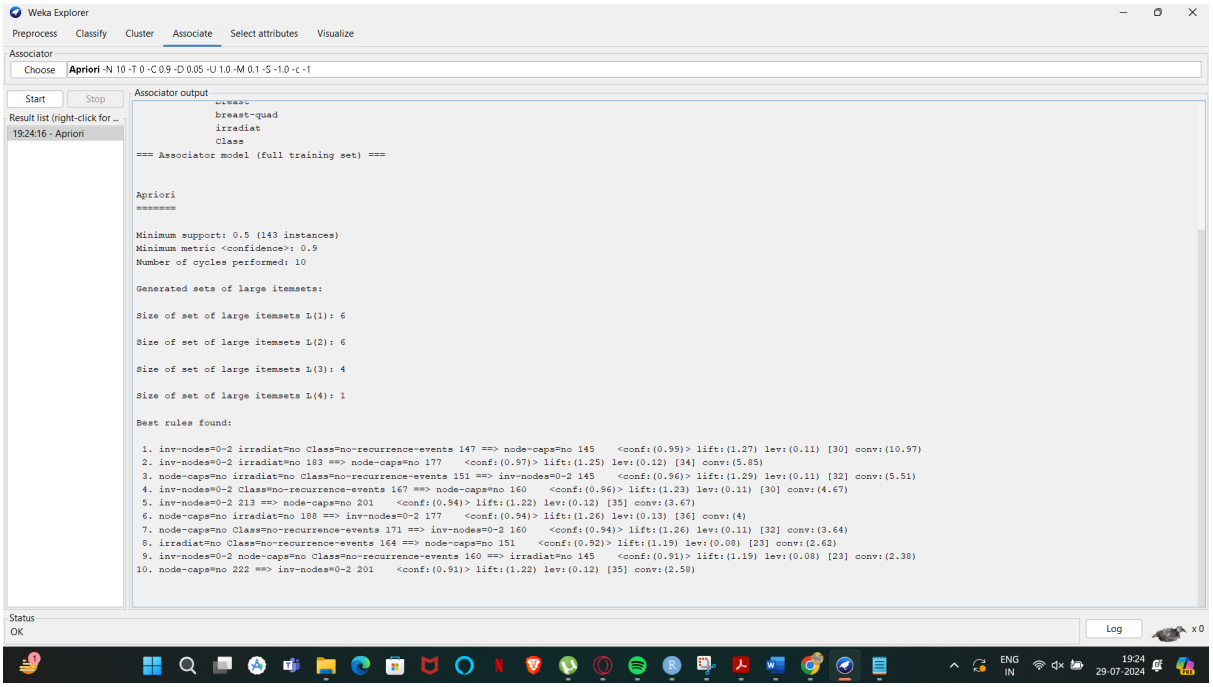


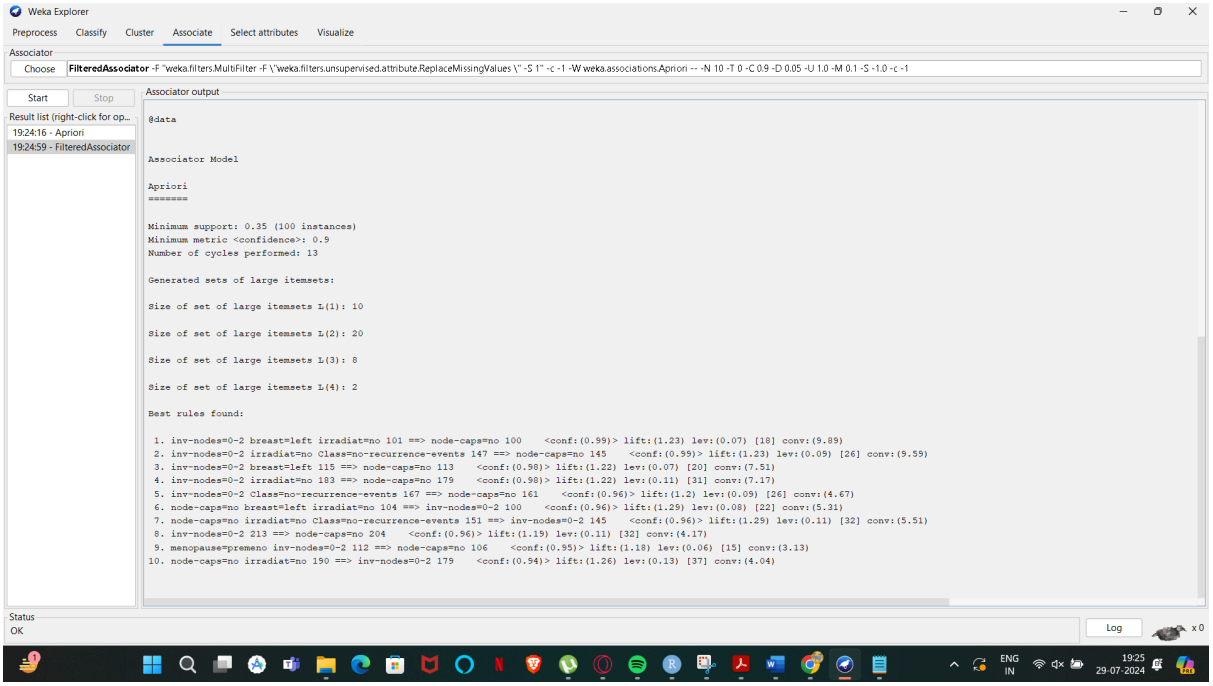


7.Create the dataset using ARFF file format:

a.Find the frequent itemsets and generate association rules on this. Assume that minimum support threshold (s = 33.33%) and minimum confident threshold (c =60%).

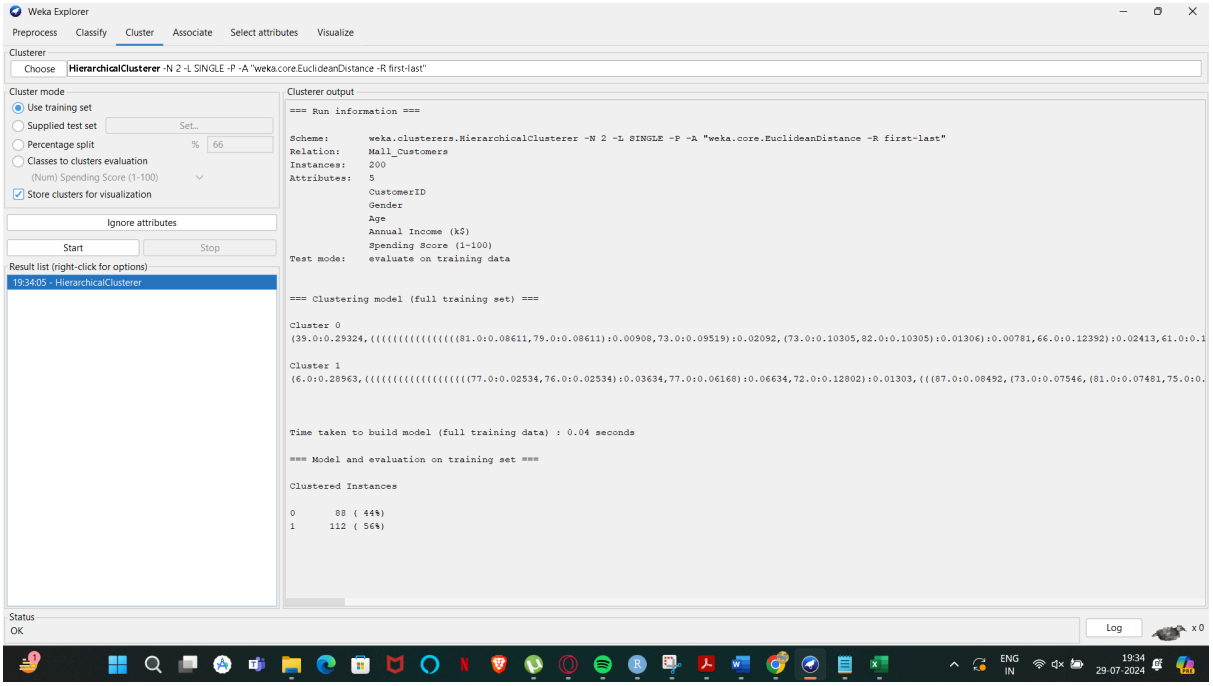
b.List the various rule generated by apriori and FP tree algorthim ,mention wheather accepted or rejcted.

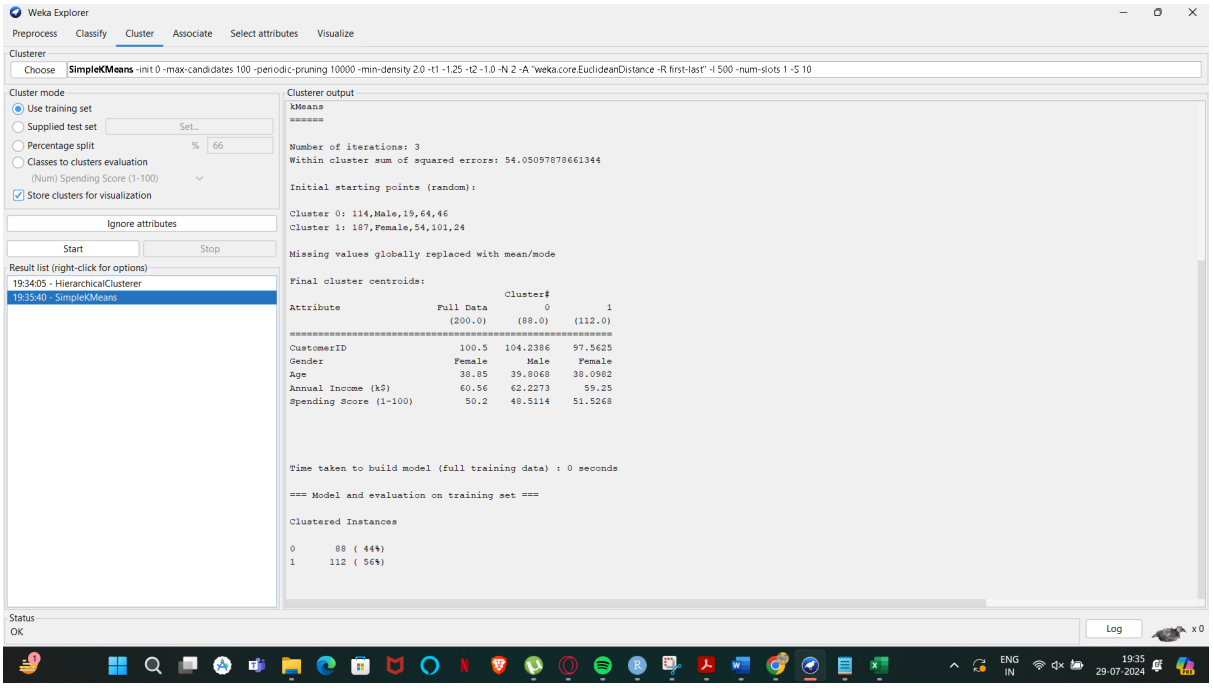




Day - 4

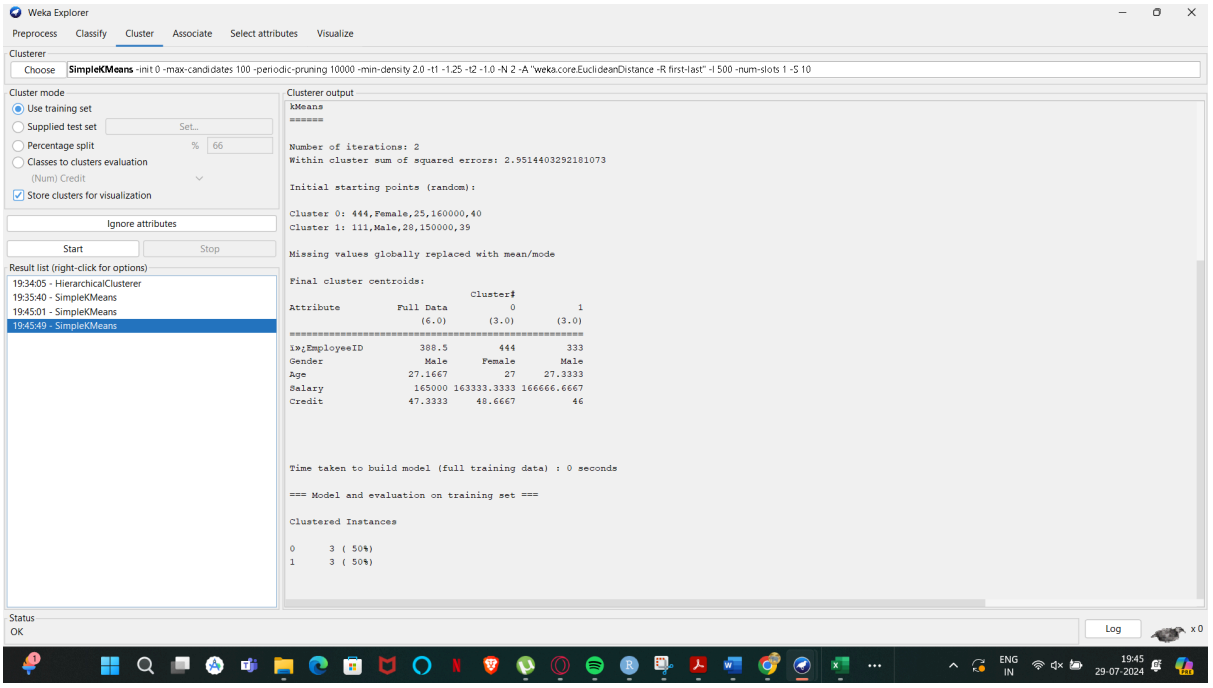
1. Consider that you are owning a supermarket mall and through membership cards, you have some basic data about your customers like Customer ID, age, gender, annual income and spending score. For the above scenario, the Problem Statement was You want to understand the customers who can easily converge [Target Customers] so that the data can be given to the marketing team and plan the strategy accordingly. For the above scenario prepare a dataset and perform Clustering Analysis to segment the customers in the Mall. There are clearly Five segments of Customers based on their Annual Income and Spending Score namely *Usual Customers, Priority Customers, Senior Citizen Target Customers, and Young Target Customers.*



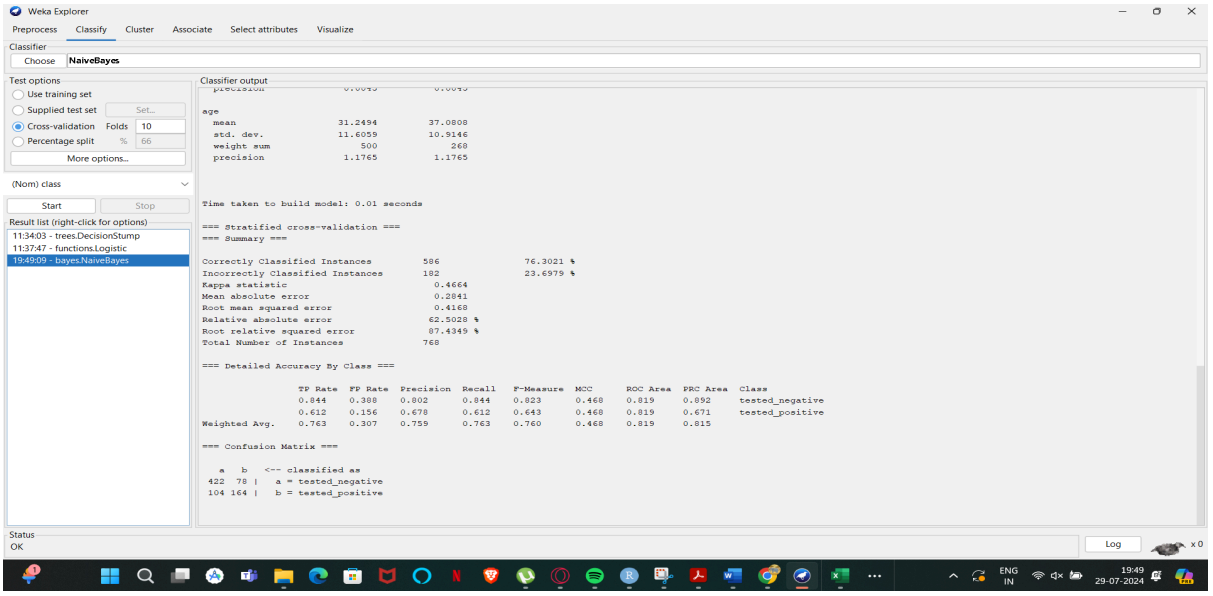


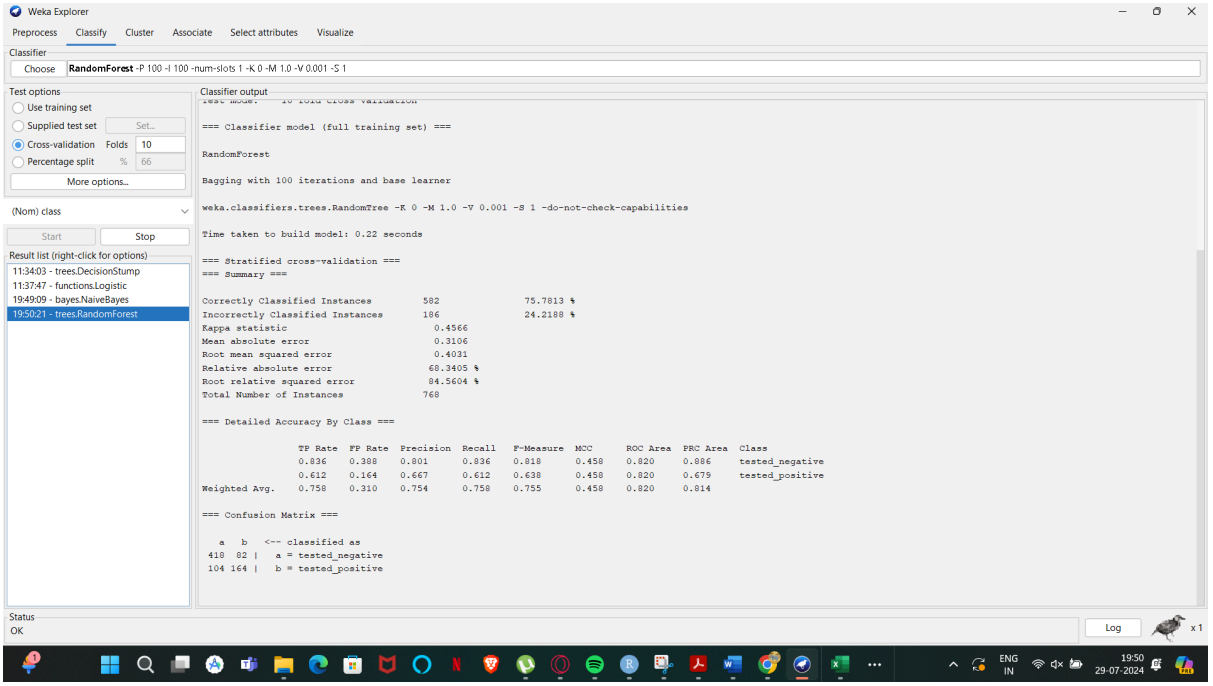
2. Create the following dataset using CSV file format. To perform cluster analysis using K- Means in WEKA. To change the cluster size and plot the graph and illustrate the visualization of cluster.

EmployeID	Gender	Age	Salary	Credit
111	Male	28	150000	39
222	Male	25	150000	27
333	Female	26	160000	42
444	Female	25	160000	40
555	Female	30	170000	64
666	Male	29	200000	72



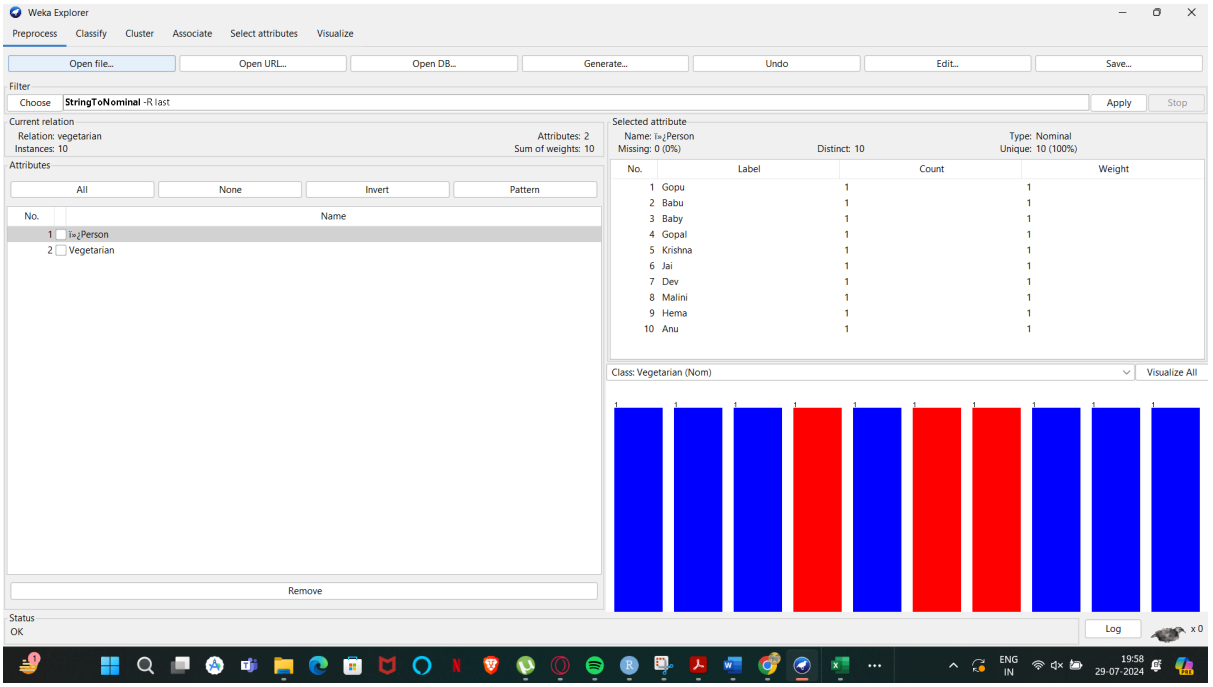
3.Prediction of categorical data using Naïve Bayes classification through WEKA using any datasets. Compare the Naïve Bayes algorithm with SVM using the summary of results given by the classifiers and plot the graph.

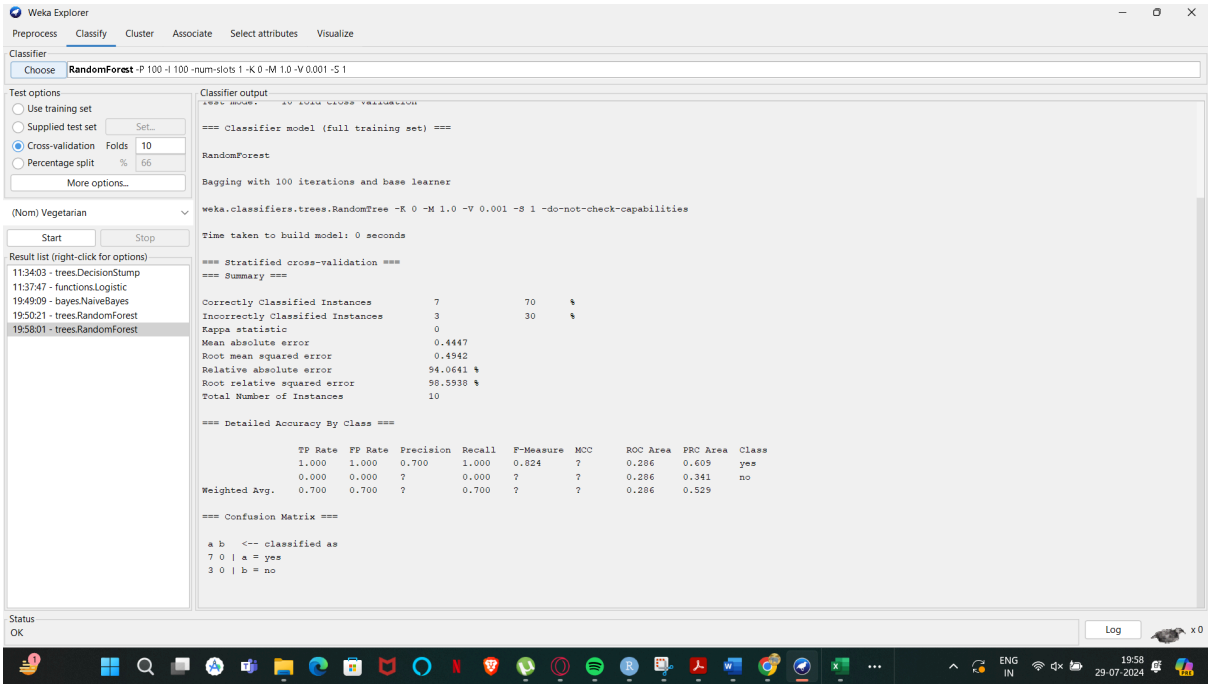




4.The following list of persons with vegetarian or not details is given in the table. How will you find out how many of them are vegetarian and how many of them are non-vegetarian? Which type of the person's total count has greater value

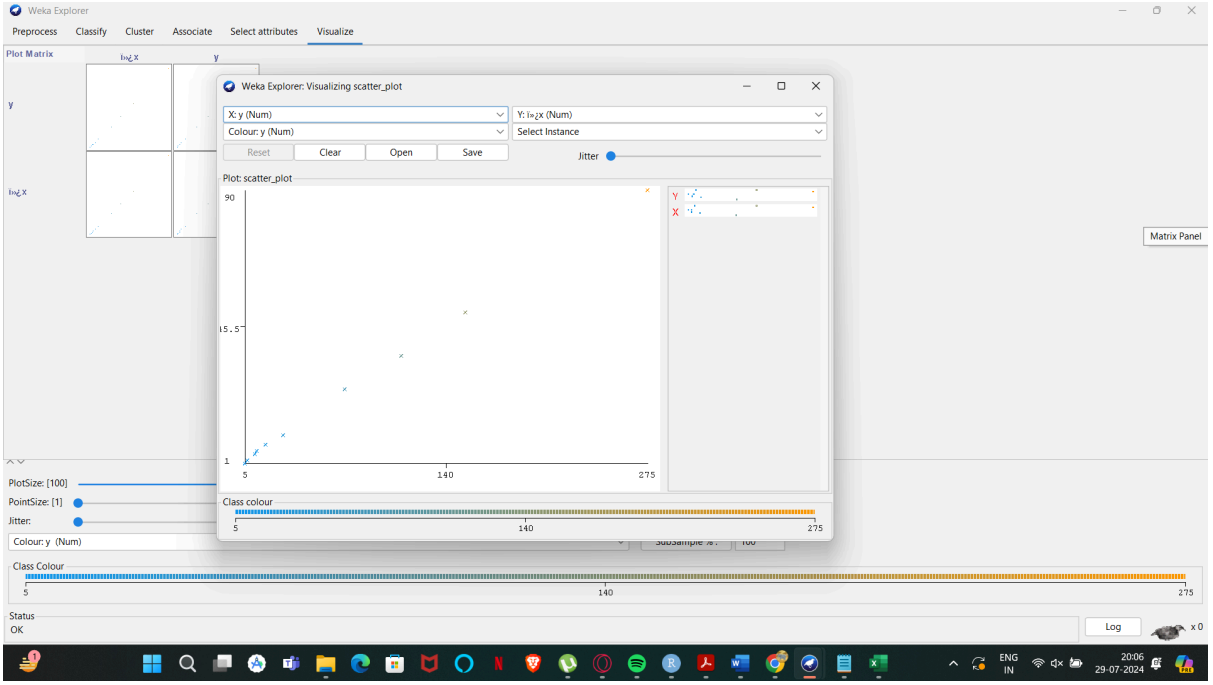
Person	Gopu	Babu	Baby	Gopal	Krishna	Jai	Dev	Malini	Hema	Anu
Vegetarian	yes	yes	yes	no	yes	no	no	yes	yes	yes





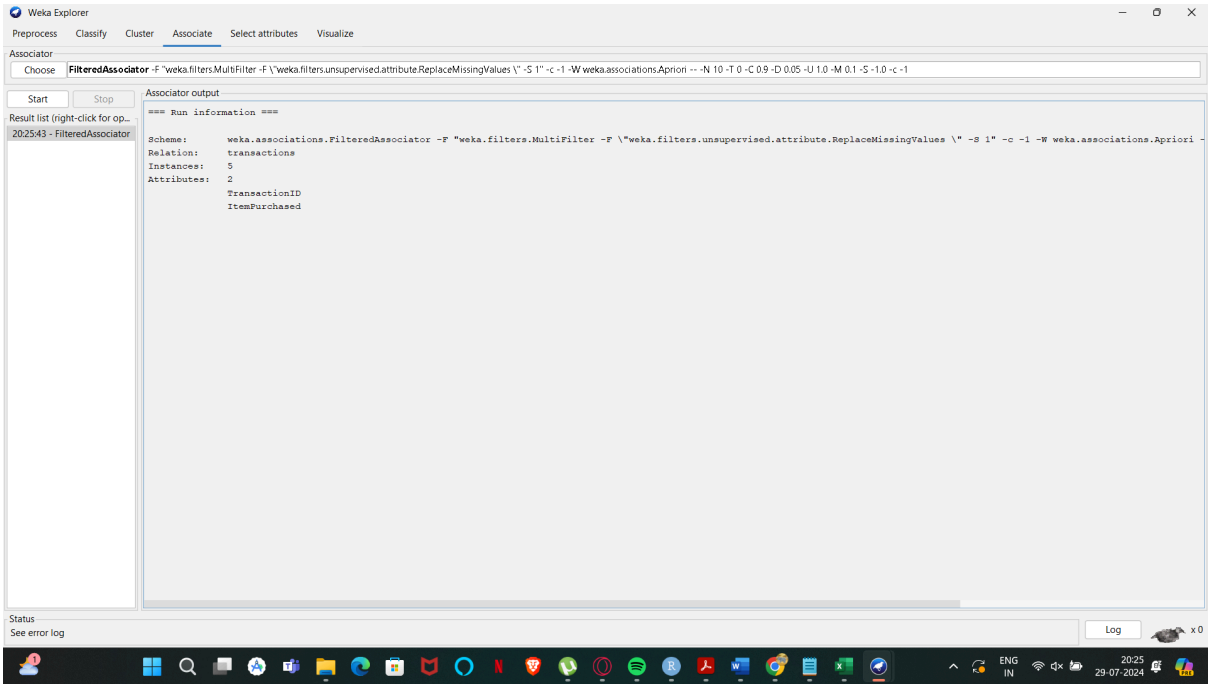
5.The following table would be plotted as (x,y) points, with the first column being the x values as number of mobile phones sold and the second column being the y values as money. To use the scatter plot for how many mobile phones sold.

x	4	1	5	7	10	2	50	25	90	36
y	12	5	13	19	31	7	153	72	275	110

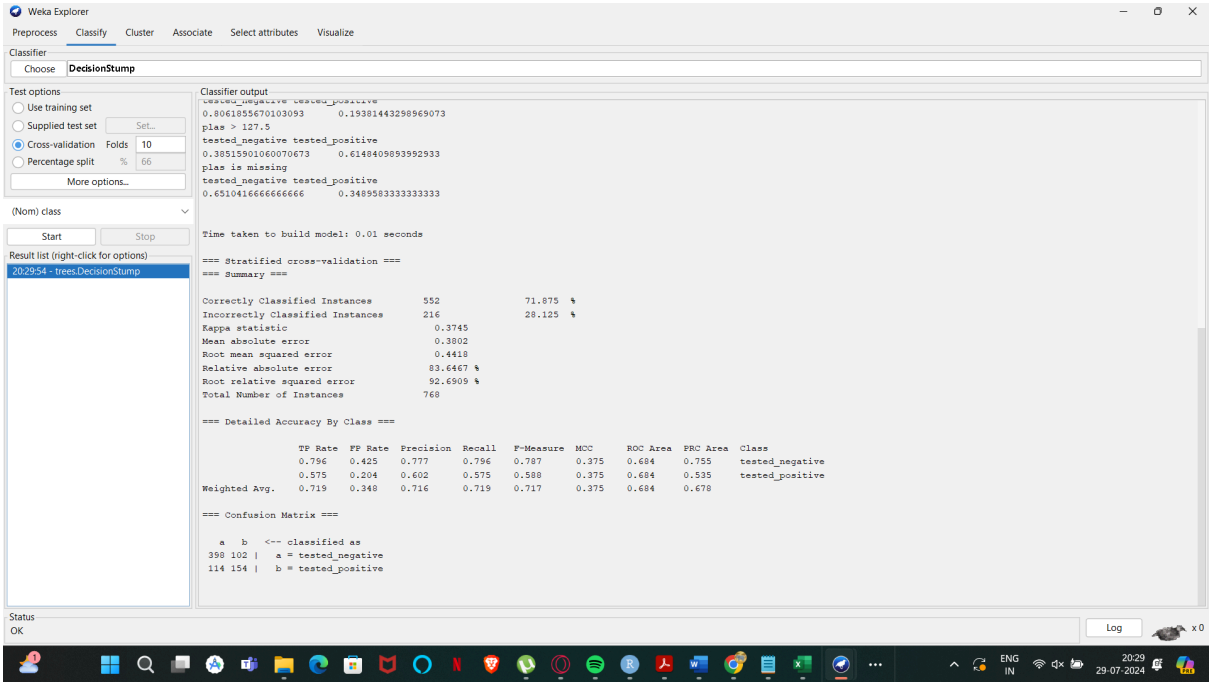


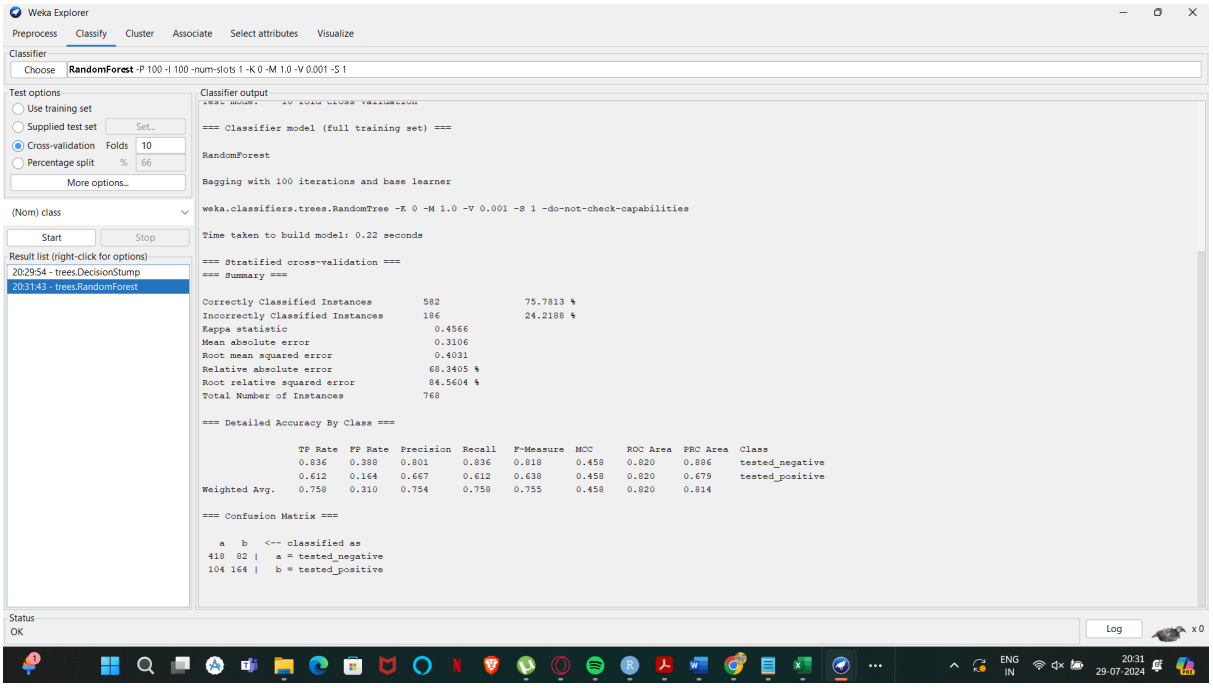
6. Generate rules using FP growth algorithm using the given dataset which has the following transactions with items purchased: Consider the values as support=50% and confidence=75%.

Transaction ID	Items Purchased
1	Bread, Cheese, Egg, Juice
2	Bread, Cheese, Juice
3	Bread, Milk, Yogurt
4	Bread, Juice, Milk
5	Cheese, Juice, Milk



7. Prediction of Diabetes Data using Decision tree classifier in WEKA. Compare it with Support Vector Machine classifier. Show the result accuracy and F1 measure calculation .Plot the graph and explain the summary of results.



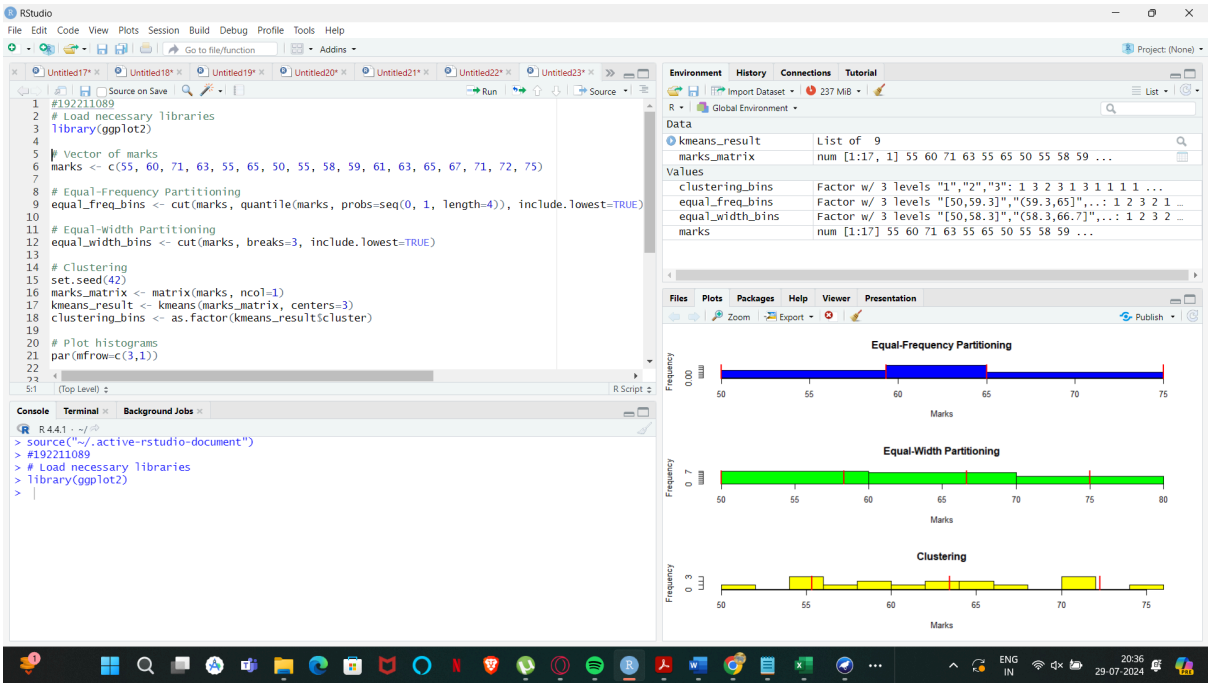


8.Implement of the R script using marks scored by a student in his model exam has been sorted as follows: 55, 60, 71, 63, 55, 65, 50, 55,58,59,61,63,65,67,71,72,75. Partition them into three bins by each of the following methods. Plot the data points using histogram.

(a) equal-frequency (equi-depth) partitioning

(b) equal-width partitioning

(c) clustering

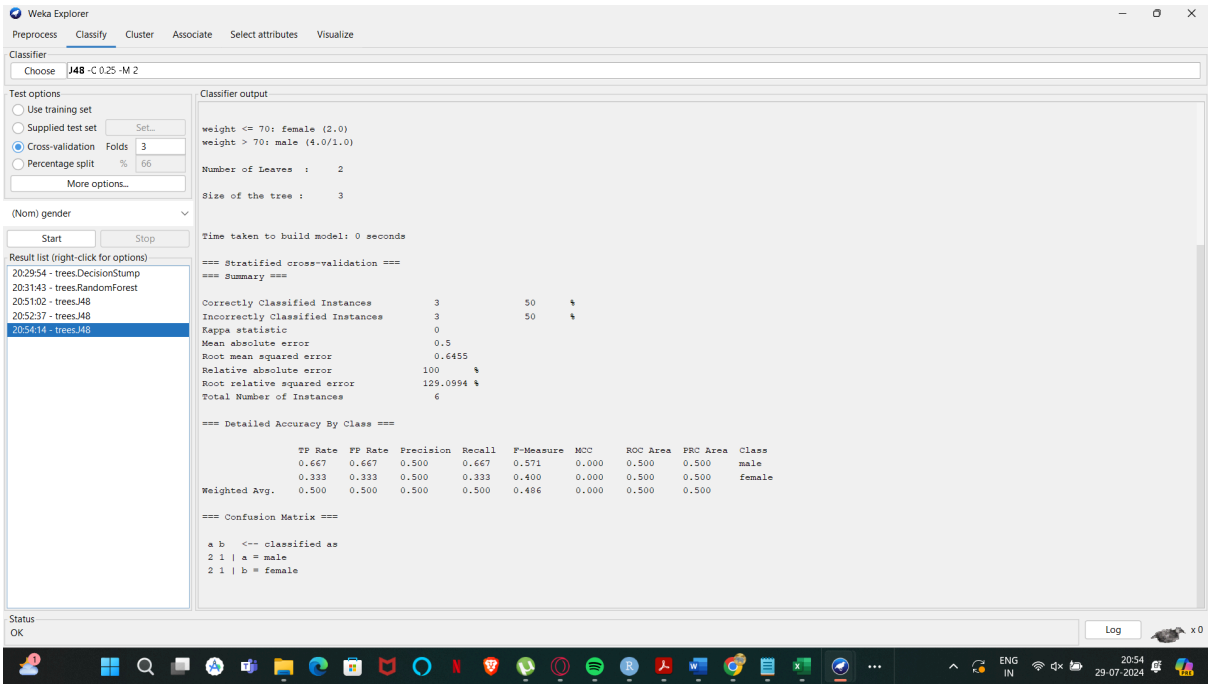


9.Consider this Decision tree :

a)create the data set for the below tree using ARFF format and calculate accuracy and decision for the same

b) Using this decision tree generate the rules based on rule based induction.

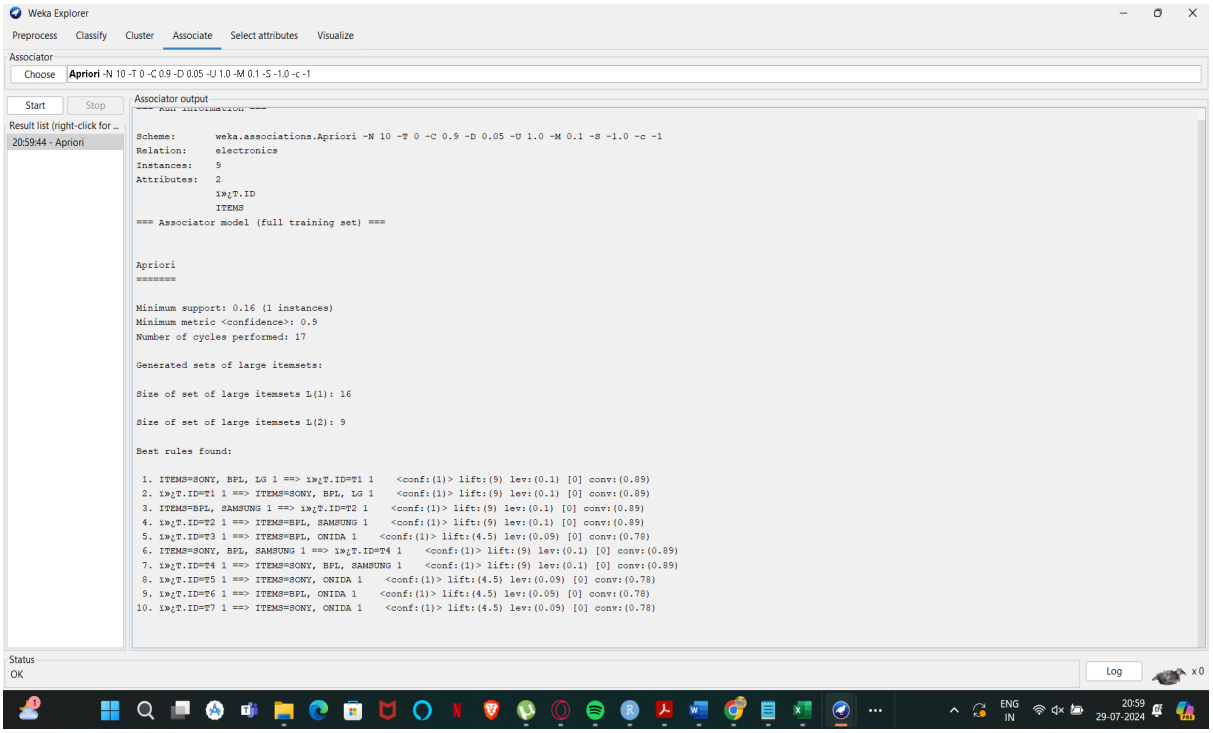
c) Compare both the algorithms and plot the confusion matrix.

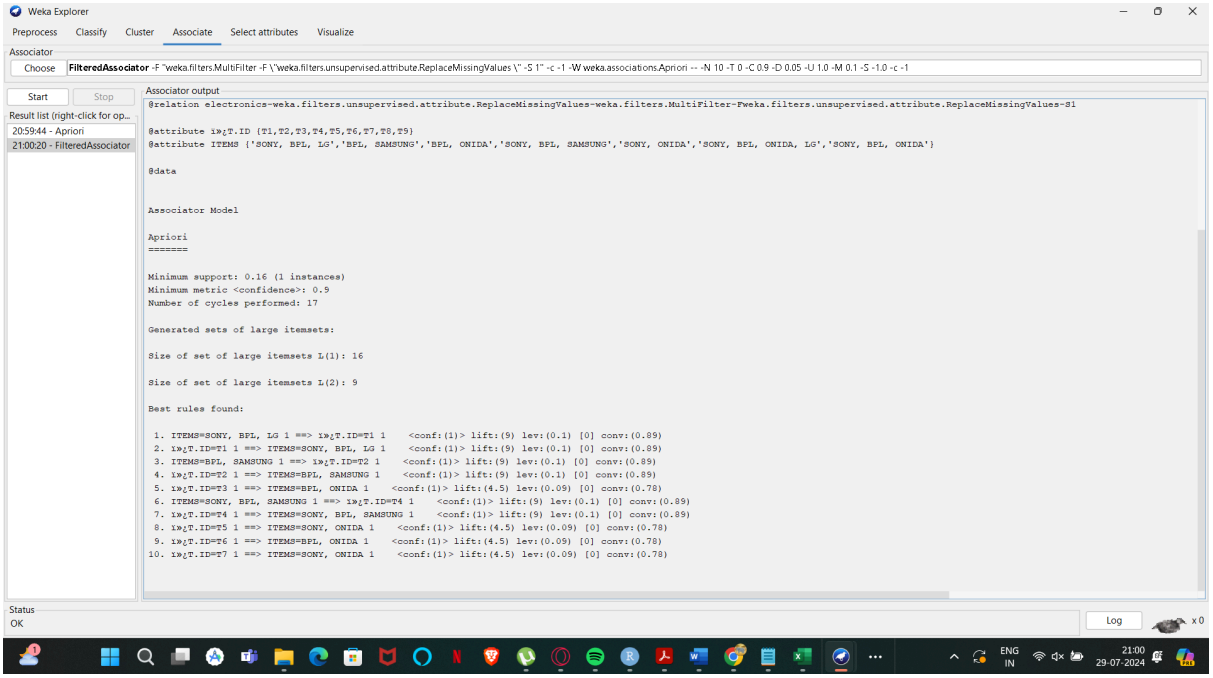


10. Create an ARFF file for the table below and implement for the Apriori Algorithm and FP growth algorithm and compare the rules generated by both the algorithms. Identify the unique rules generated by the above algorithms.

NOTE: Assume Min_sup=2 and confidence= 50%

T.ID	ITEMS
T1	SONY, BPL, LG
T2	BPL, SAMSUNG
T3	BPL, ONIDA
T4	SONY, BPL, SAMSUNG
T5	SONY, ONIDA
T6	BPL, ONIDA
T7	SONY, ONIDA
T8	SONY, BPL, ONIDA, LG
T9	SONY, BPL, ONIDA





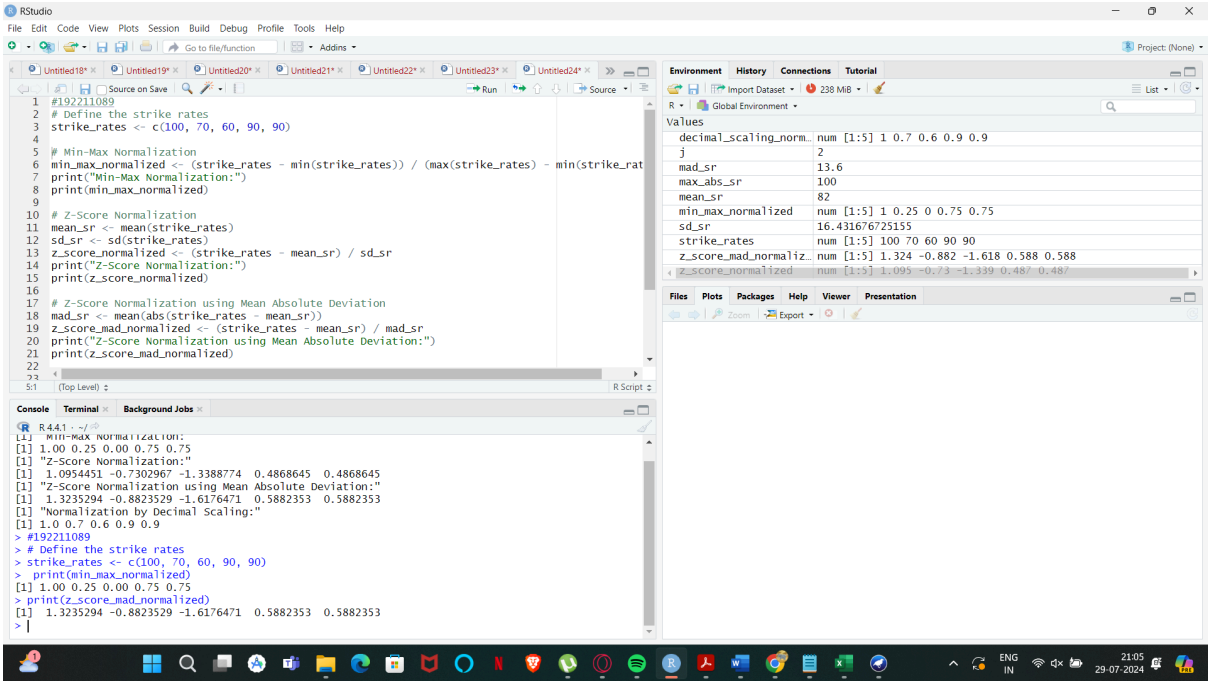
11.The given are the strike-rates scored by a batsman in season 1 in different tournaments. 100, 70, 60, 90, 90

(a) min-max normalization by setting min = 0 and max = 1

(b) z-score normalization

(c) z-score normalization using the mean absolute deviation instead of standard deviation

(d) normalization by decimal scaling

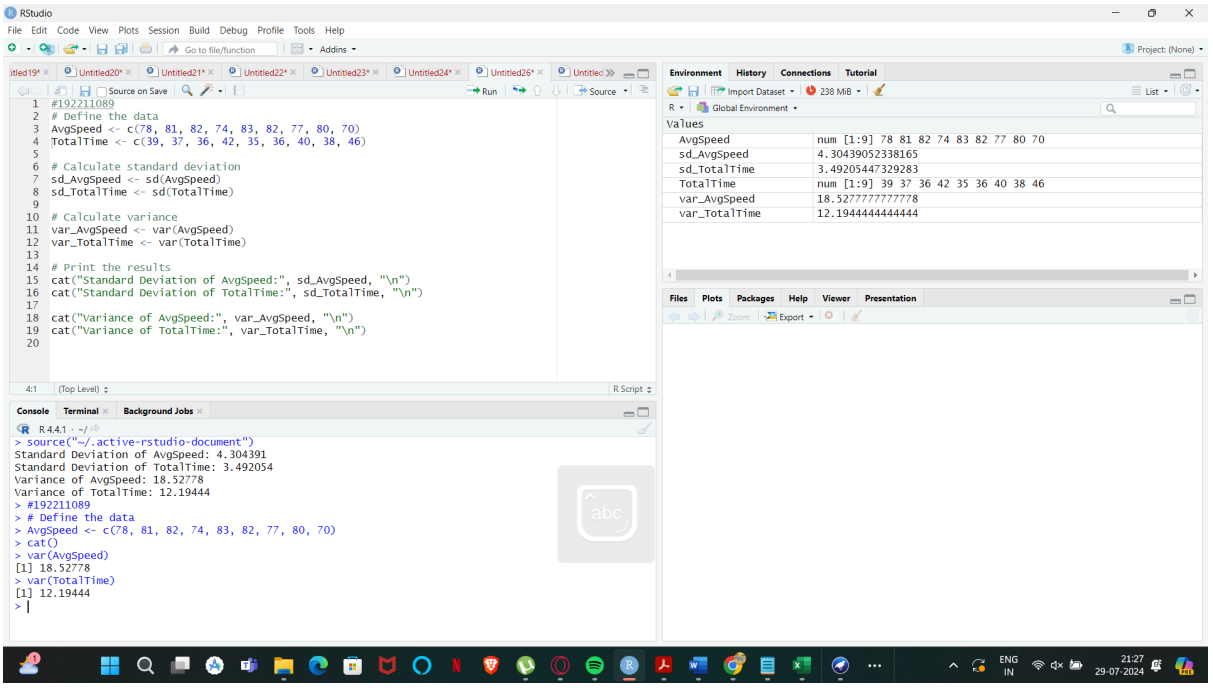


12. Suppose some car is tested for the AvgSpeed and TotalTime data for 9 randomly selected car with the following result

AvgSpeed (in kph)	**78**	**81**	**82**	**74**	**83**	**82**	**77**	**80**	**70**
TotalTime (in mins)	**39**	**37**	**36**	**42**	**35**	**36**	**40**	**38**	**46**

a) Calculate the standard deviation of AvgSpeed and TotalTime.

b) Calculate the Variance of AvgSpeed and TotalTime for the above dataset.



13)Consider this table

a) **TID items bought**

b) **T100 {M, O, N, K, E, Y}**

c) **T200 {D, O, N, K, E, Y }**

d) **T300 {M, A, K, E}**

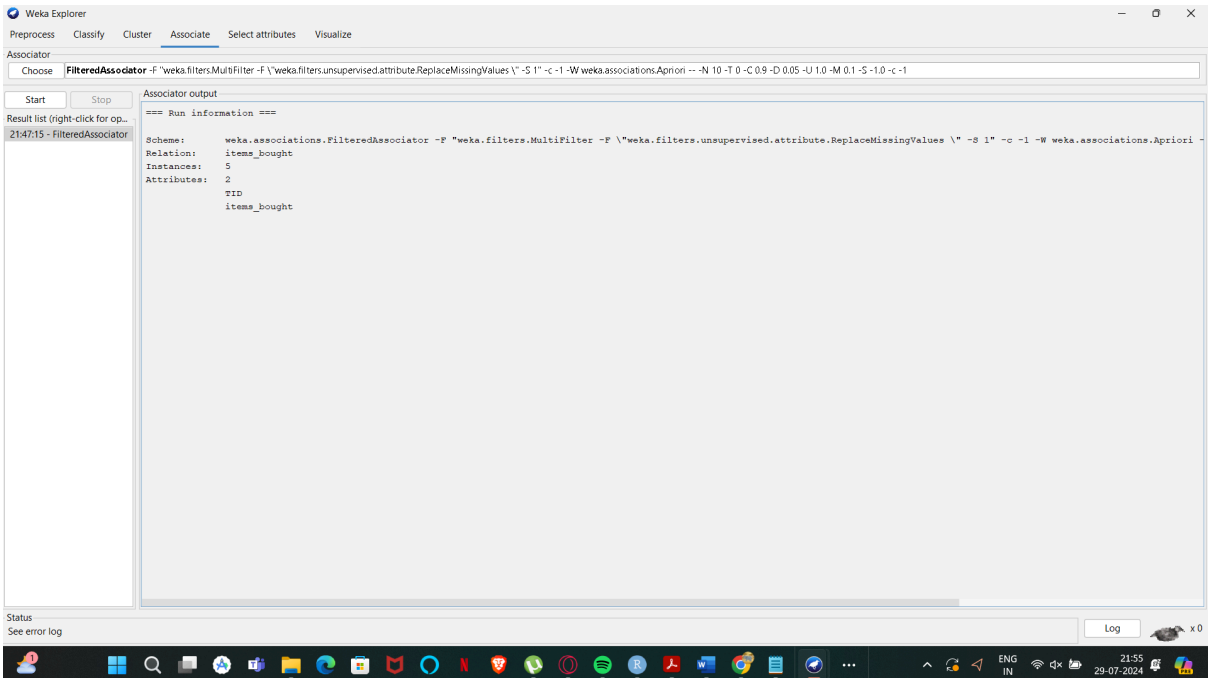
e) **T400 {M, U, C, K, Y}**

f) **T500 {C, O, O, K, I ,E}**

g) **(a) Find all frequent item set using Apriori and FP-growth, respectively. Compare the efficiency of the two mining processes.**

h) **(b) List all of the strong association rules (with support s and confidence c) matching the following metarule, where X is a variable representing customers, and itemi denotes variables representing items (e.g., "A", "B", etc.):**

i) **$\forall x \in$ transaction, buys(X, item1) $\wedge$ buys(X, item2) $\Rightarrow$ buys(X, item3)**



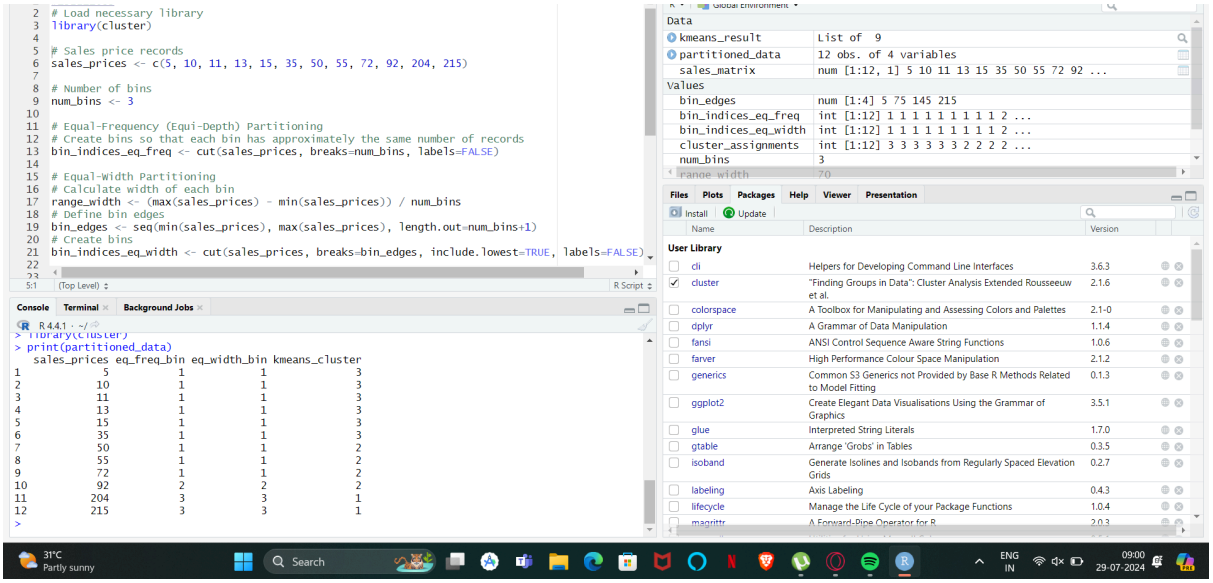
QUESTION BANK :

1. Implement of the R script using a group of 12 sales price records has been sorted as follows: 5, 10, 11, 13, 15, 35, 50, 55, 72, 92, 204, 215. Partition them into three bins by each of the following methods.

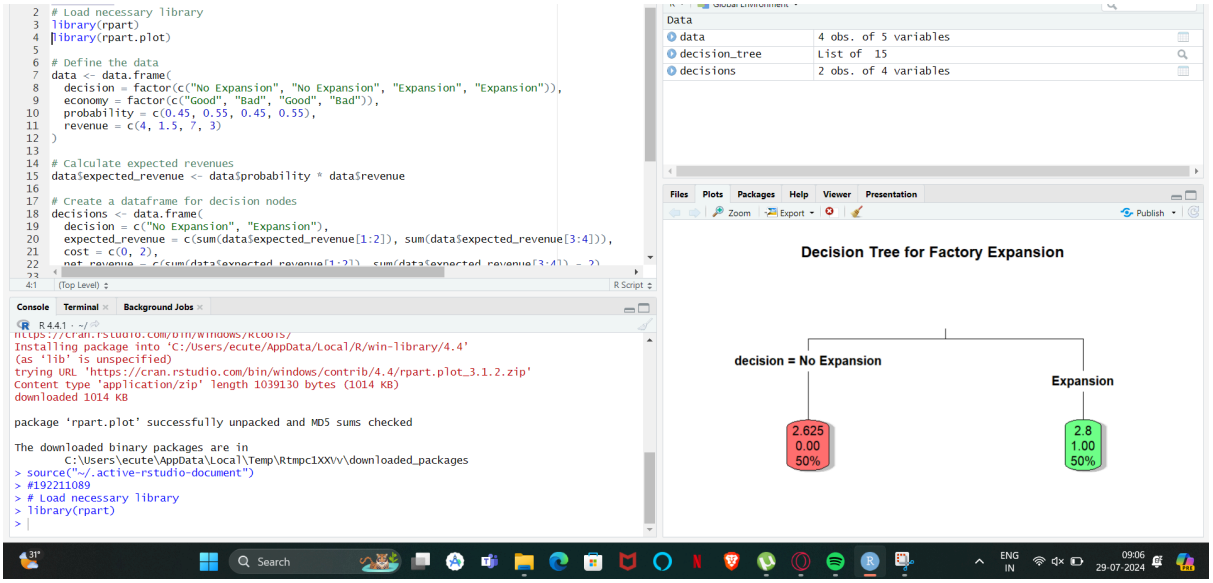
(a) equal-frequency (equi depth) partitioning

(b) equal-width partitioning

(c) clustering

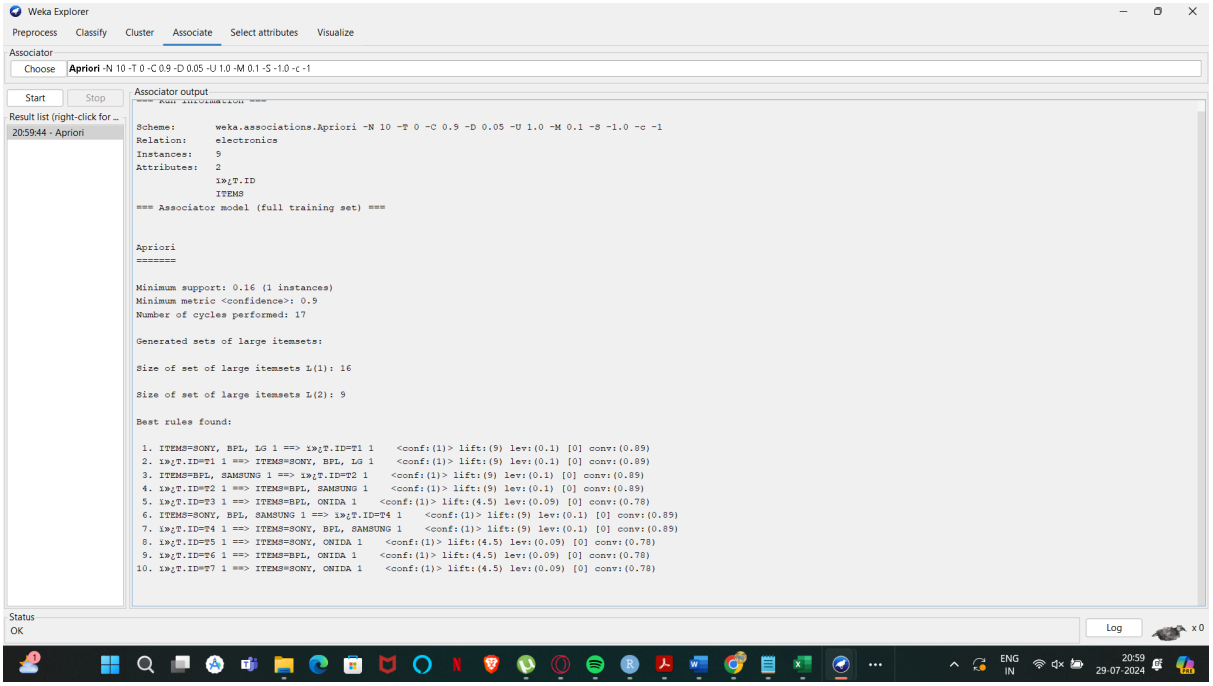


2. A gadget factory has been quite successful for the past 10 years and Ms.Marry, the manager of the company wondering whether to expand the factory this year or not. The cost to expand factory is $2M. With no expansion, expected revenue is $4M if the economy stays good; while only $1.5M if the economy is bad. If manager expands the factory, expected to receive $7M. if economy is good and $3M if economy is bad. Assume that there is a 45% chance of a good economy and a 55% chance of a bad economy. Draw a Decision Tree showing these choices.

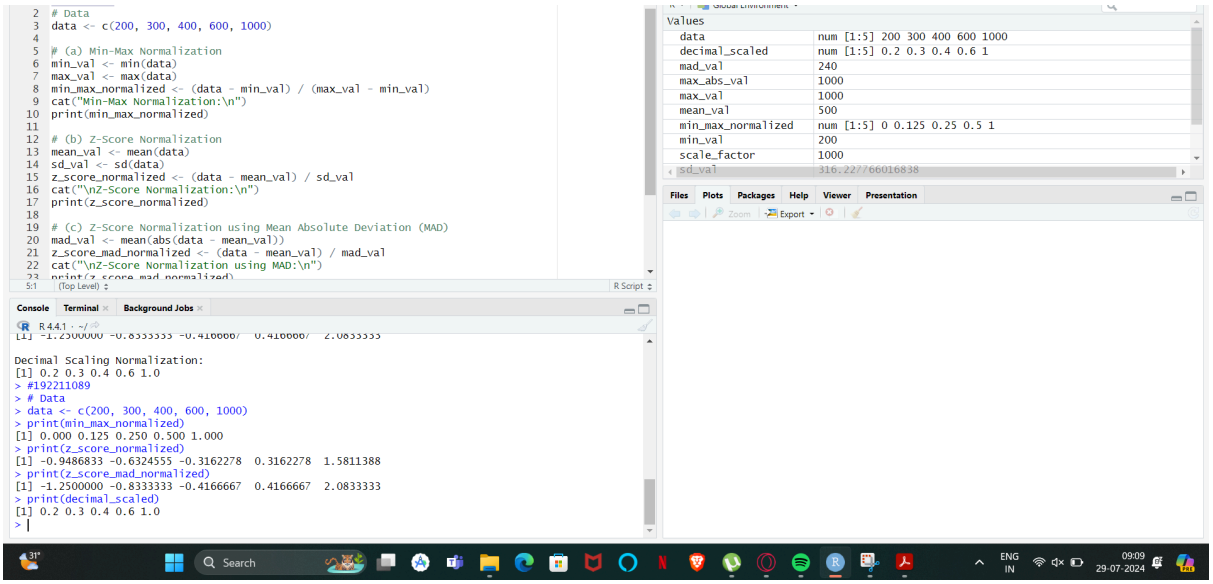


3. Implement using WEKA for the given Apply Apriori Algorithm for given database below Assume Min_sup=2 TID Items

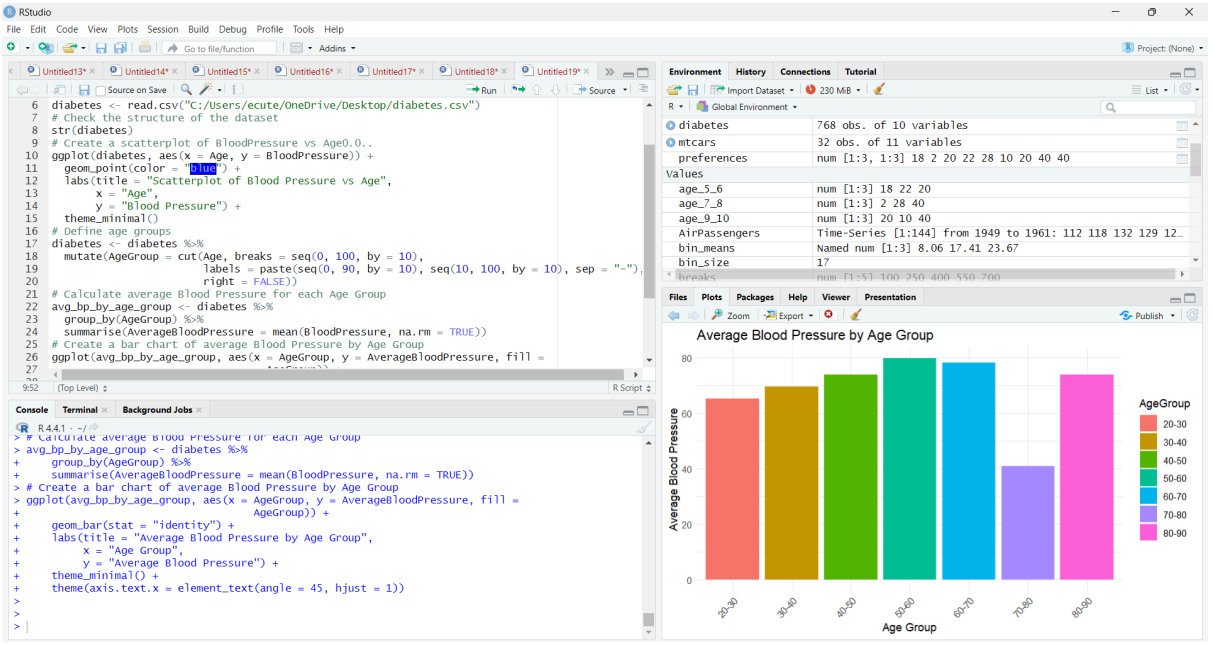
TID	Items
1	Bread, Peanuts, Milk, Fruit, Jam
2	Bread, Jam, Soda, Chips, Milk, Fruit
3	Steak, Jam, Soda, Chips, Bread
4	Jam, Soda, Peanuts, Milk, Fruit
5	Jam, Soda, Chips, Milk, Bread
6	Fruit, Soda, Chips, Milk
7	Fruit, Soda, Peanuts, Milk
8	Fruit, Peanuts, Cheese, Yogurt



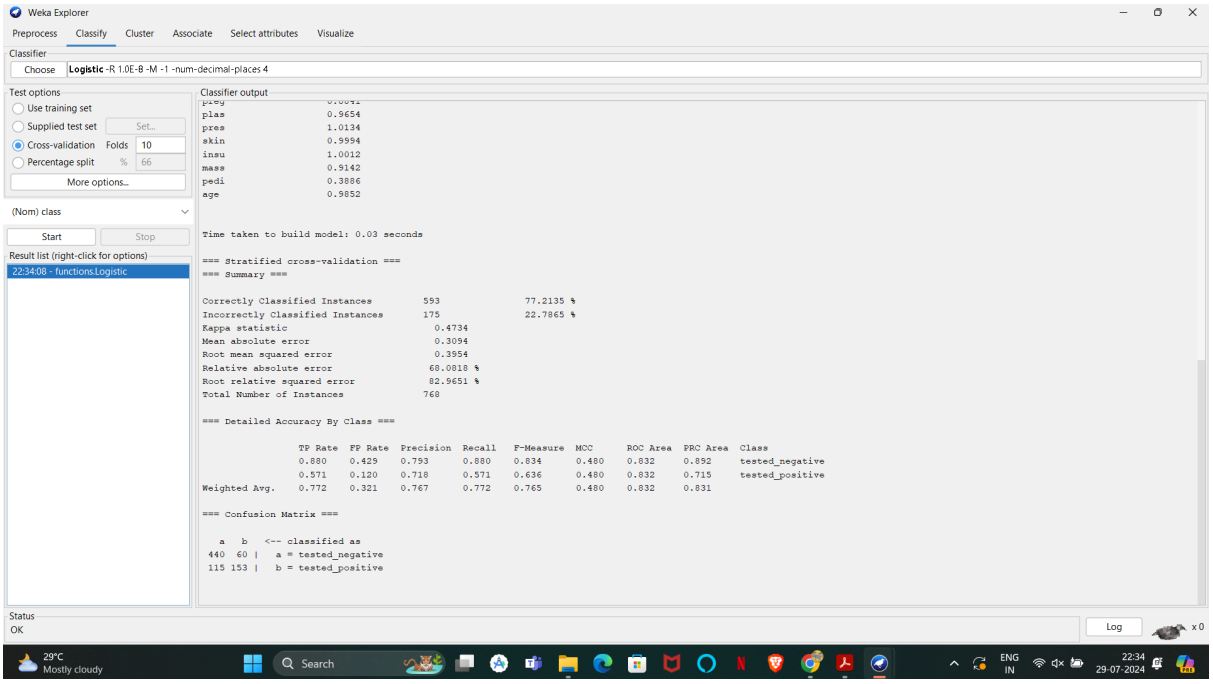
4. Use following group of data: 200, 300, 400, 600, 1000
(a) min-max normalization by setting min = 0 and max = 1 (b)
(b) z-score normalization
(c) (c) z-score normalization using the mean absolute deviation instead of standard deviation (d) normalization by decimal scaling

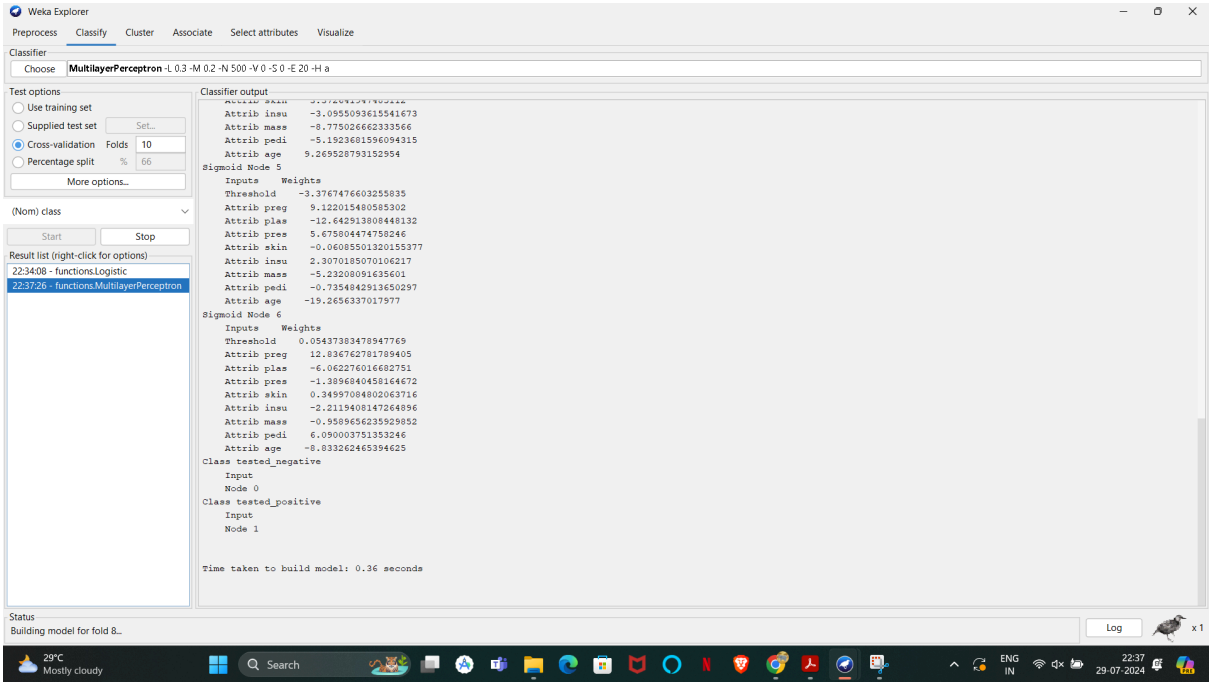


5. Implement using R language in which age group of people are affected byblood pressure based on the diabetes dataset show it using scatterplot and bar chart (that is BloodPressure vs Age using dataset “diabetes.csv”)



6. Analysis the dataset “diabetes. csv” how the diabetes trend is for different age people, using linear regression and multiple regression.





7. Implement using WEKA for the given Suppose a database has five transactions. Let min sup= 50%(2) and min con f = 80%.

Transactions Items

T1 (M, O, N, K, E, Y)

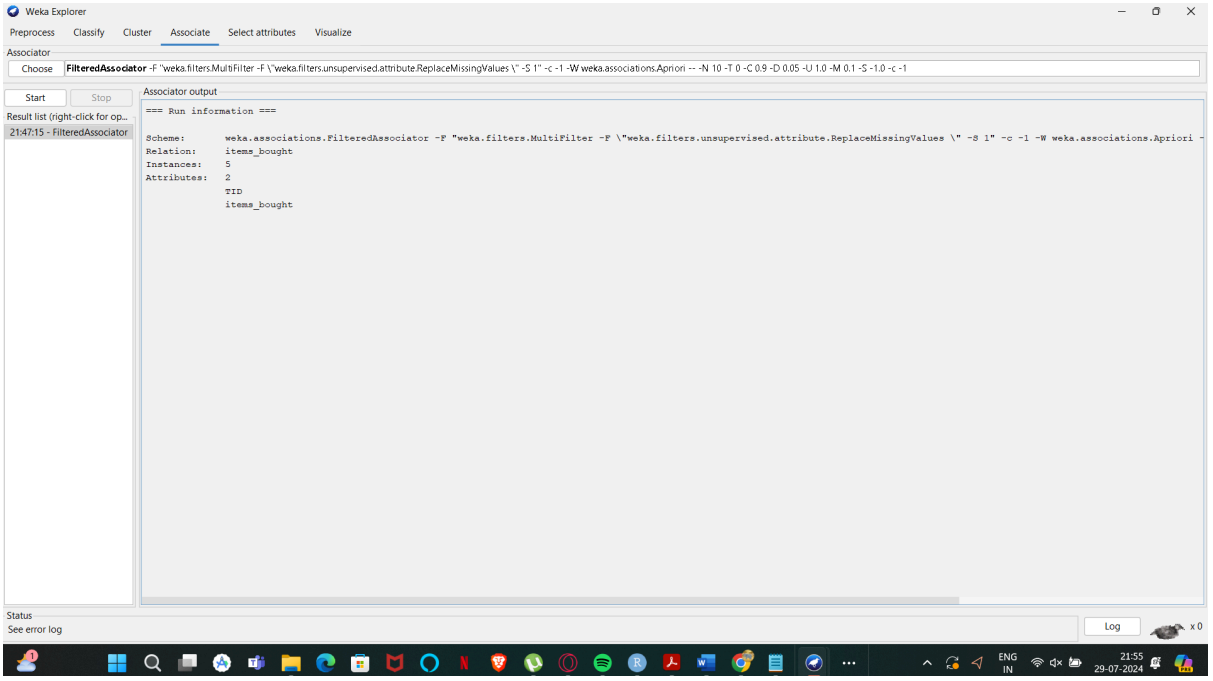
T2 (D, O, N, K, E, Y)

T3 (M, A, K, E)

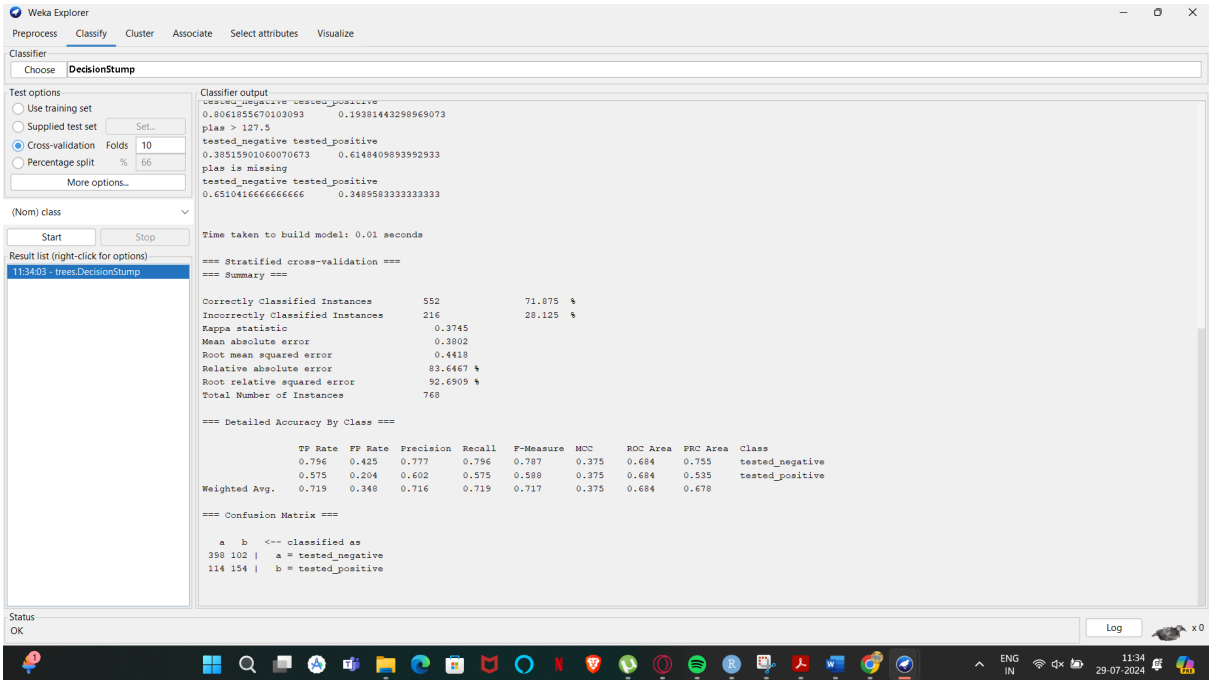
T4 (M, U, C, K, Y)

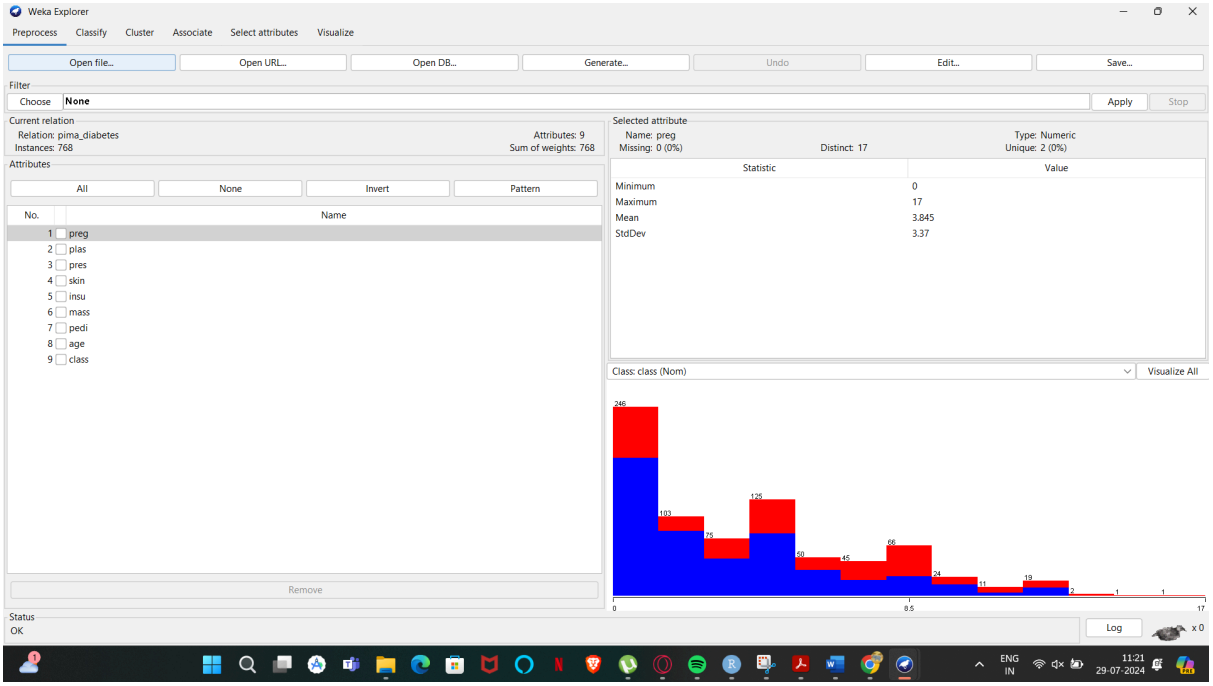
T5 (C,O, O, K, I ,E)

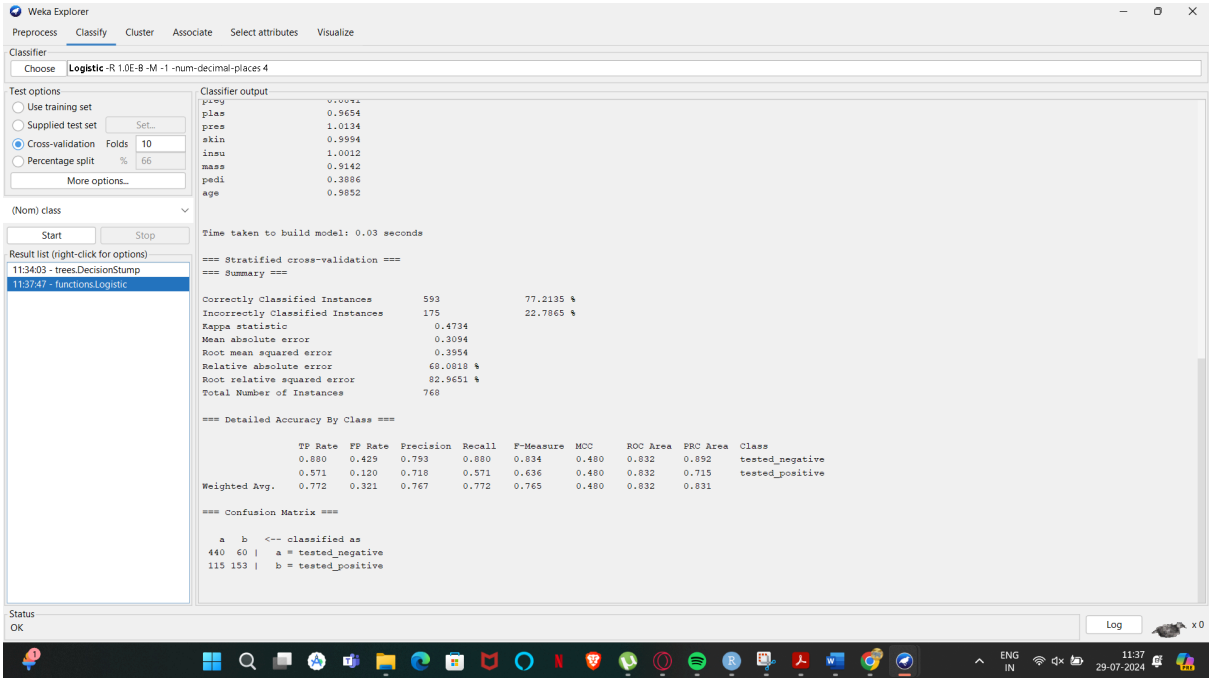
- **Find all frequent item sets using Apriori algorithm**
- **Also draw FP-Growth Tree**



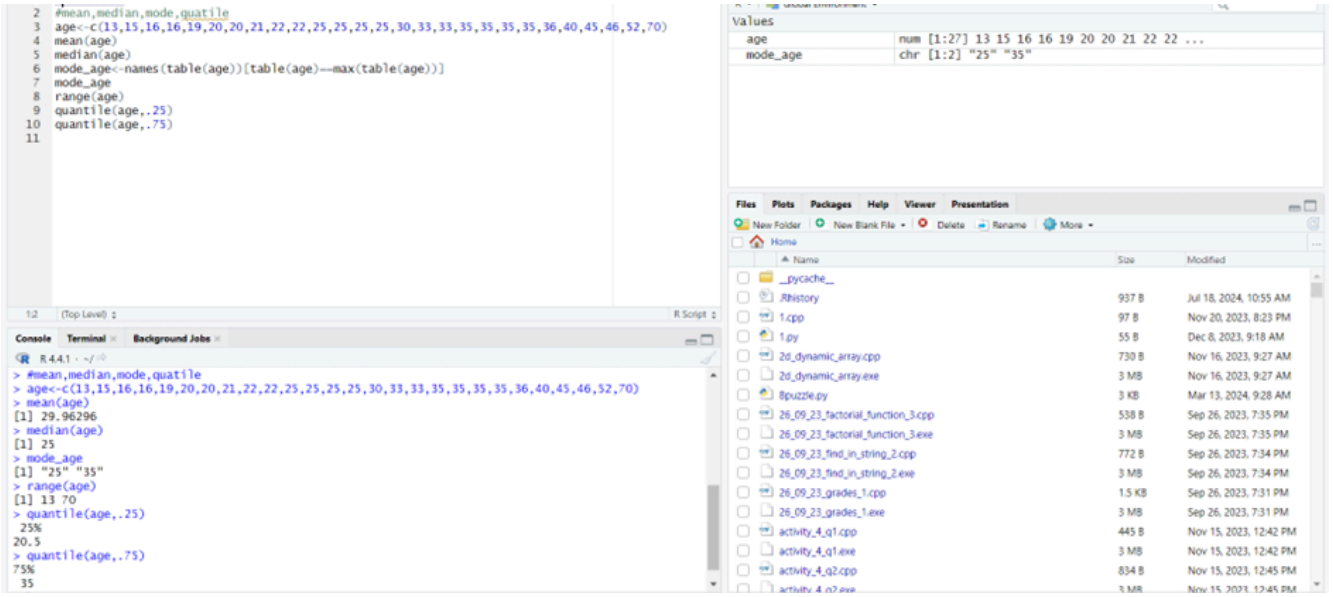
8. Prediction of Categorical Data using Decision Tree Algorithm through WEKA using any datasets. a) Tree b) Preprocess c) Logistic



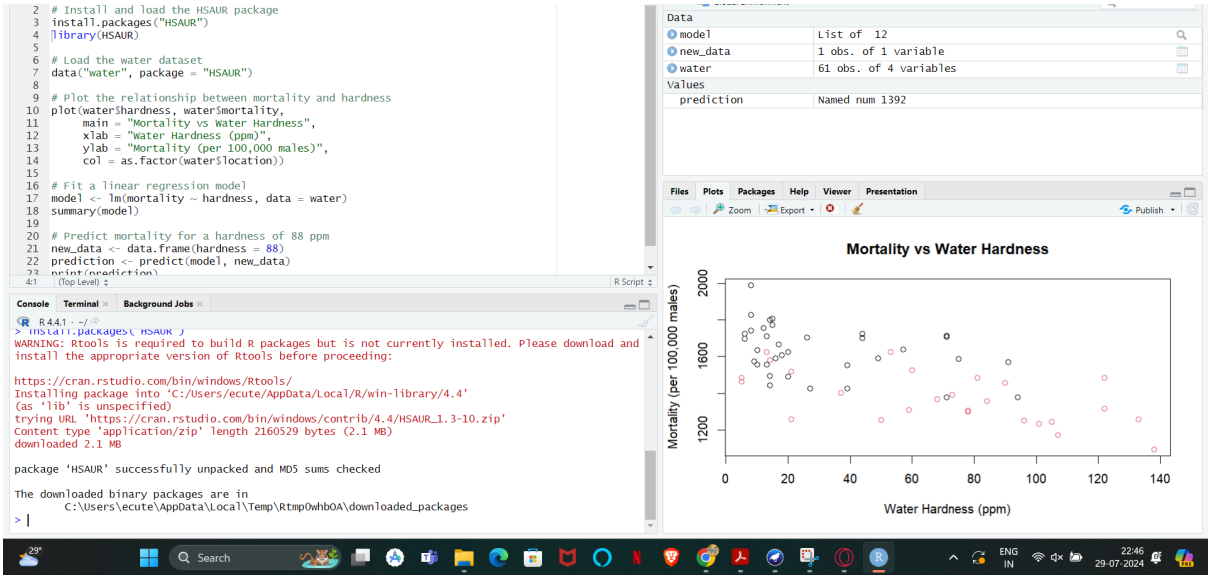

Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Open file...
Open URL...
Open DB...
Generate...
Undo
Edit...
Save...
Filter
Choose
None
Apply
Stop
Current relation
Relation: pima_diabetes
Instances: 768
Attributes: 9
Sum of weights: 768
Attributes
All
None
Invert
Pattern
No.
Name
1 preg
2 plas
3 pres
4 skin
5 insu
6 mass
7 pedi
8 age
9 class
Remove
Selected attribute
Name: preg
Missing: 0 (0%)
Distinct: 17
Type: Numeric
Unique: 2 (0%)
Statistic
Value
Minimum 0
Maximum 17
Mean 3.845
StdDev 3.37
Class: class (Nom)
Visualize All
246
103
75
125
60
45
66
24
11
19
2
1
1
0
8.5
17
Status
OK
Log
x 0
ENG
IN
11:21
29-07-2024


Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Classifier
Choose
Logistic -R 1.0E-8 -M -1 -num-decimal-places 4
Test options
Use training set
Supplied test set
Set...
Cross-validation
Folds
10
Percentage split
%
66
More options...
(Nom) class
Start
Stop
Result list (right-click for options)
11:34:03 - trees.DecisionStump
11:37:47 - functions.Logistic
Classifier output
plas 0.9654
pres 1.0134
skin 0.9994
insu 1.0012
mass 0.9142
pedi 0.3886
age 0.9852
Time taken to build model: 0.03 seconds
=== Stratified cross-validation ===
=== Summary ===
Correctly Classified Instances 593 77.2135 %
Incorrectly Classified Instances 175 22.7865 %
Kappa statistic 0.4734
Mean absolute error 0.3094
Root mean squared error 0.3954
Relative absolute error 68.0818 %
Root relative squared error 82.9651 %
Total Number of Instances 768
=== Detailed Accuracy By Class ===
TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class
0.880 0.429 0.793 0.880 0.834 0.480 0.832 0.892 tested_negative
0.571 0.120 0.718 0.571 0.636 0.480 0.832 0.715 tested_positive
Weighted Avg. 0.772 0.321 0.767 0.772 0.765 0.480 0.832 0.831
=== Confusion Matrix ===
a b <-- classified as
440 60 | a = tested_negative
115 153 | b = tested_positive
Status
OK
Log
x 0
ENG
IN
11:37
29-07-2024

9. Suppose that the data for analysis includes the attribute age. The age values for the data tuples are (in increasing order) 13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.
Can you find (roughly) the first quartile (Q1) and the third quartile (Q3) of the data?



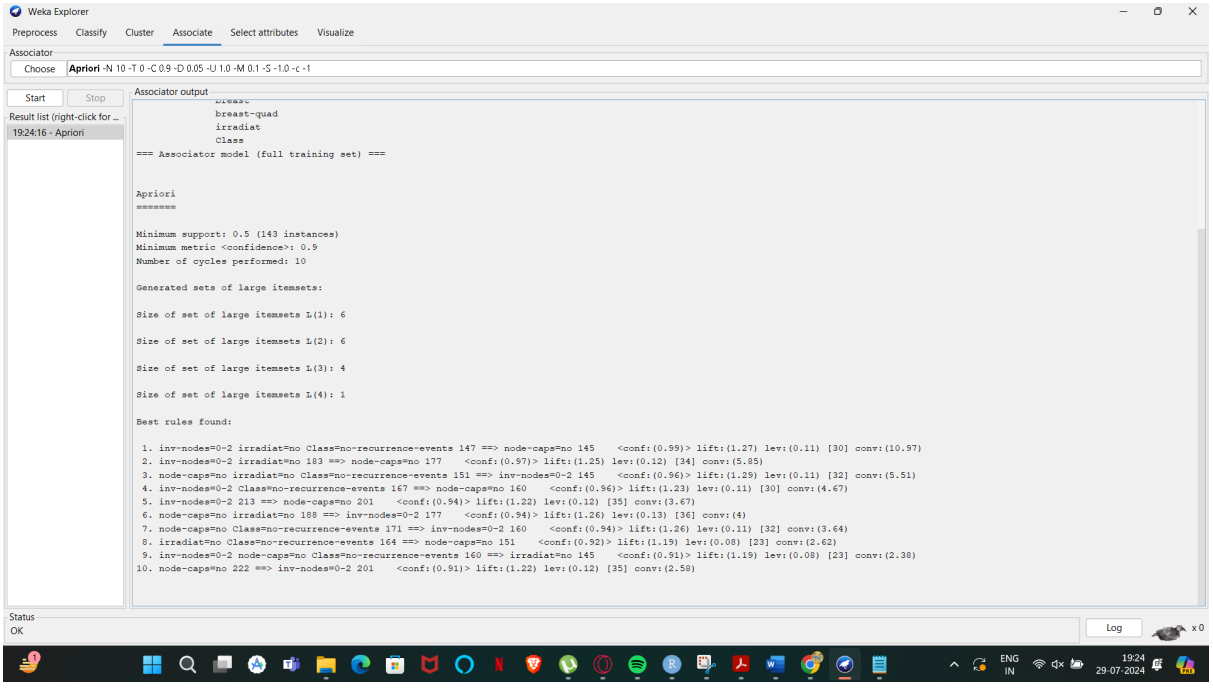
10. Download the Dataset "water" From R dataset Link.Find out whether there is a linear relation between attributes"mortality" and"hardness" by plot function.Fit the Data into the Linear Regression model. Predict the mortality for the hardness=88.

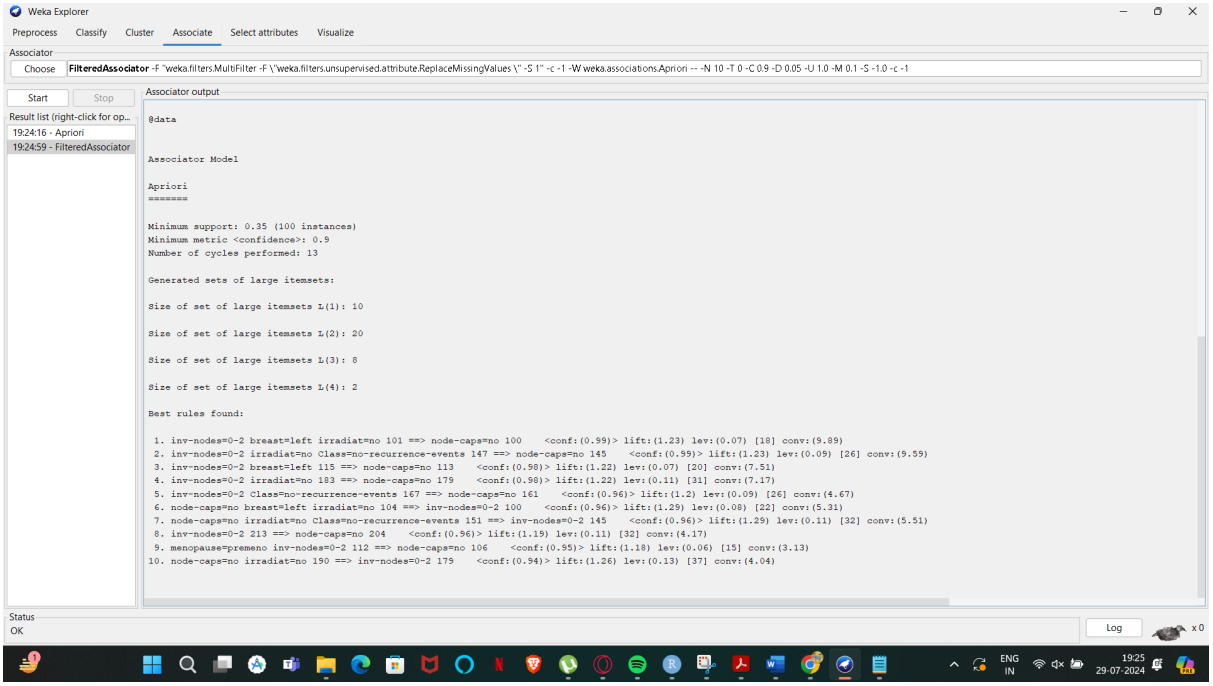


11. Create the dataset using ARFF file format:
a.Find the frequent itemsets and generate association rules on this. Assume that minimum support threshold (s = 33.33%) and minimum confident threshold (c = 60%).

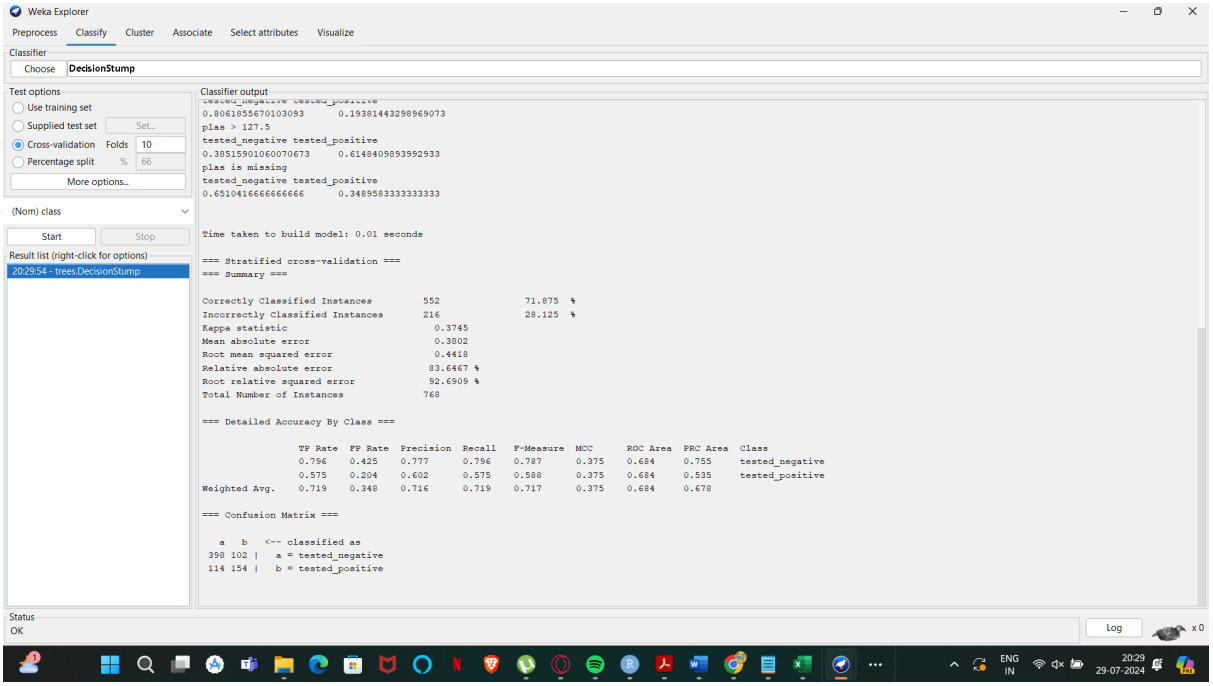
b.List the various rule generated by apriori and FP tree algorthim ,mention wheather accepted or rejcted.

Transaction ID	Items
T1	Hot Dogs, Buns, Ketchup
T2	Hot Dogs, Buns
T3	Hot Dogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	Hot Dogs, Coke, Chips

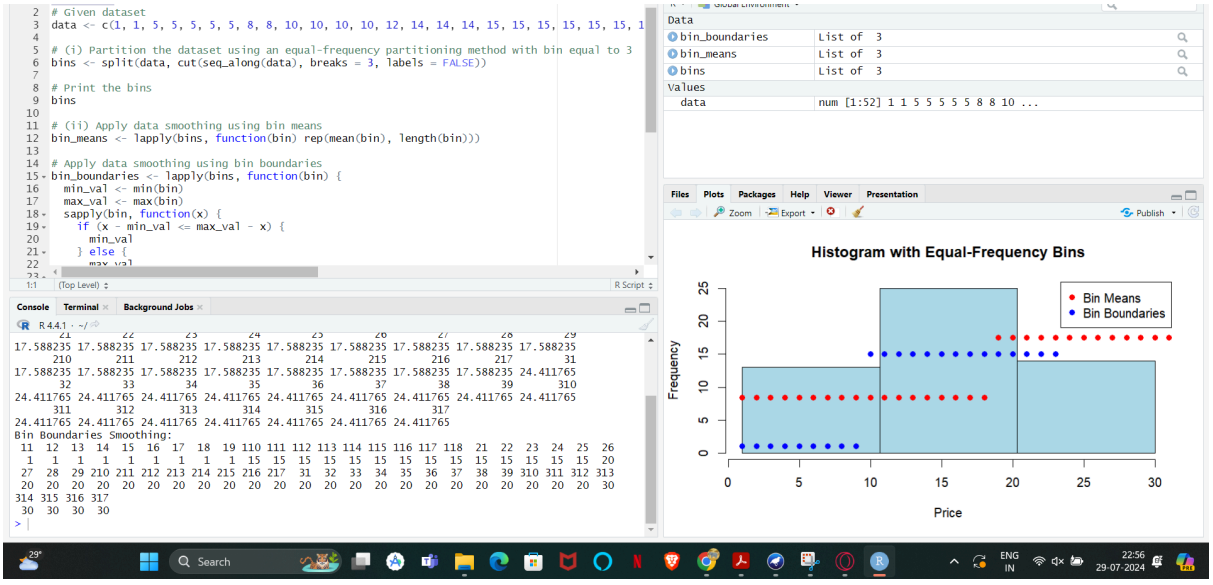




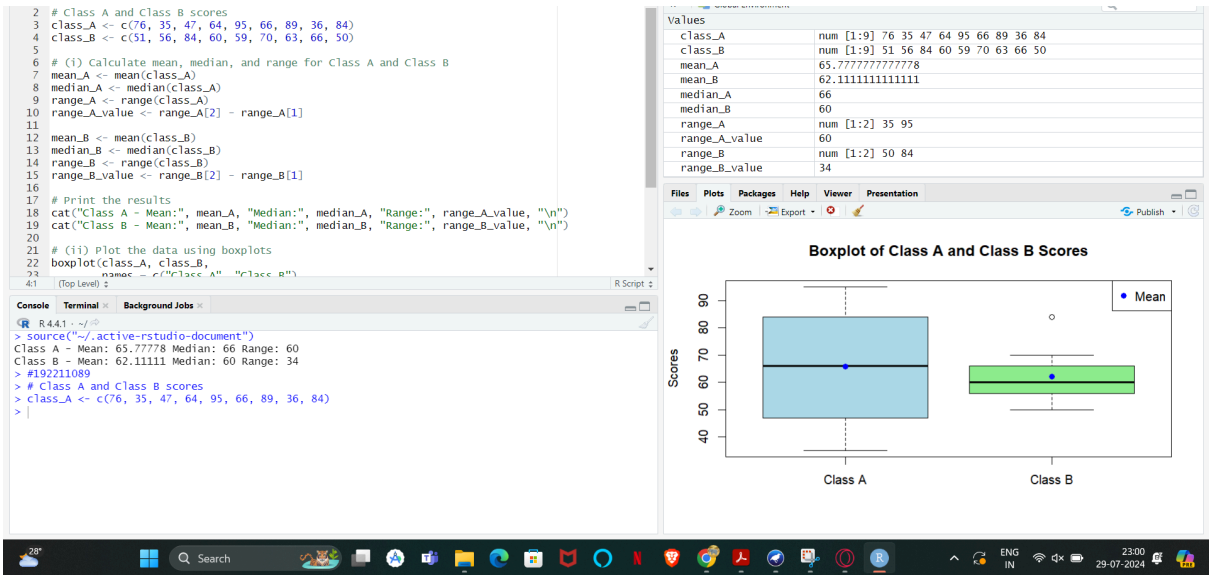
12. Prediction of Categorical Data using Rule base classification and decision tree classification through WEKA using any datasets. Compare the accuracy using two algorithm and plot the graph



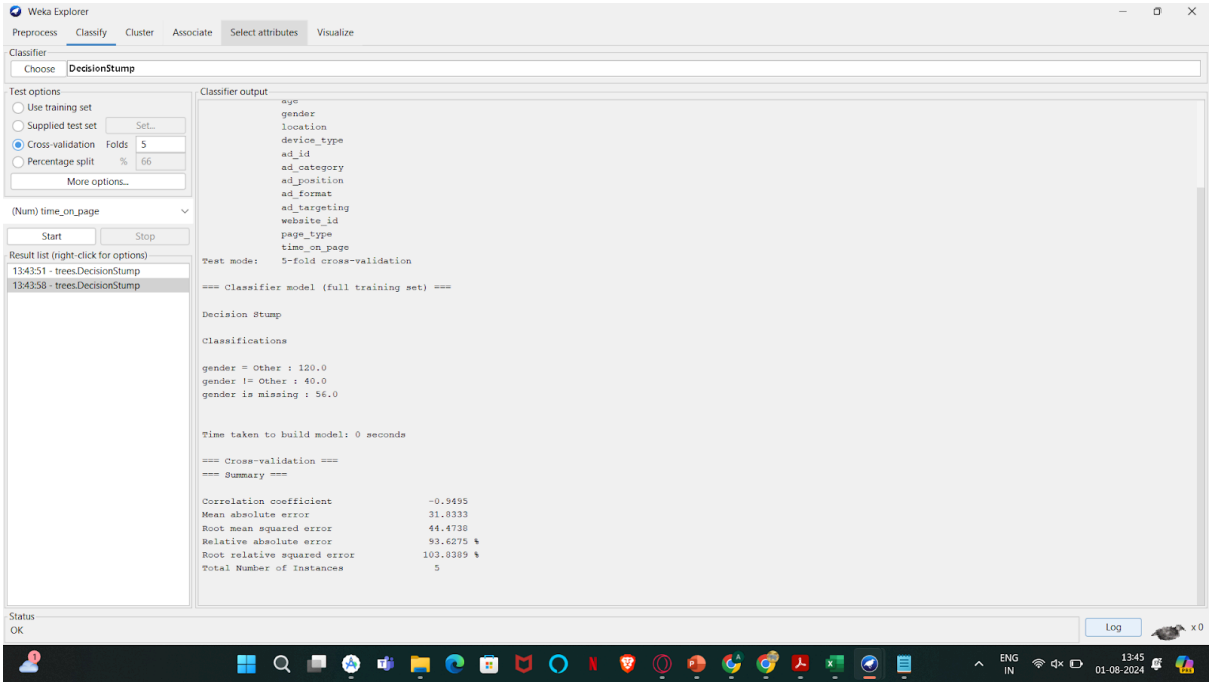
13. Imagine that you have selected data from the All Electronics data warehouse for analysis. The data set will be huge! The following data are a list of All Electronics prices for commonly sold items (rounded to the nearest dollar). The numbers have been sorted: 1, 1, 5, 5, 5, 5, 5, 8, 8, 10, 10, 10, 10, 12, 14, 14, 14, 15, 15, 15, 15, 15, 15, 18, 18, 18, 18, 18, 18, 18, 18, 20, 20, 20, 20, 20, 20, 20, 21, 21, 21, 21, 25, 25, 25, 25, 25, 28, 28, 30, 30, 30. (i) Partition the dataset using an equal-frequency partitioning method with bin equal to 3 (ii) apply data smoothing using bin means and bin boundary. (iii) Plot Histogram for the above frequency division



14. Two Maths teachers are comparing how their Year 9 classes performed in the end of year exams. Their results are as follows: Class A: 76, 35, 47, 64, 95, 66, 89, 36, 8476,35,47,64,95,66,89,36,84 Class B: 51, 56, 84, 60, 59, 70, 63, 66, 5051,56,84,60,59,70,63,66,50 (i) Find which class had scored higher mean, median and range. (ii) Plot above in boxplot and give the inferences



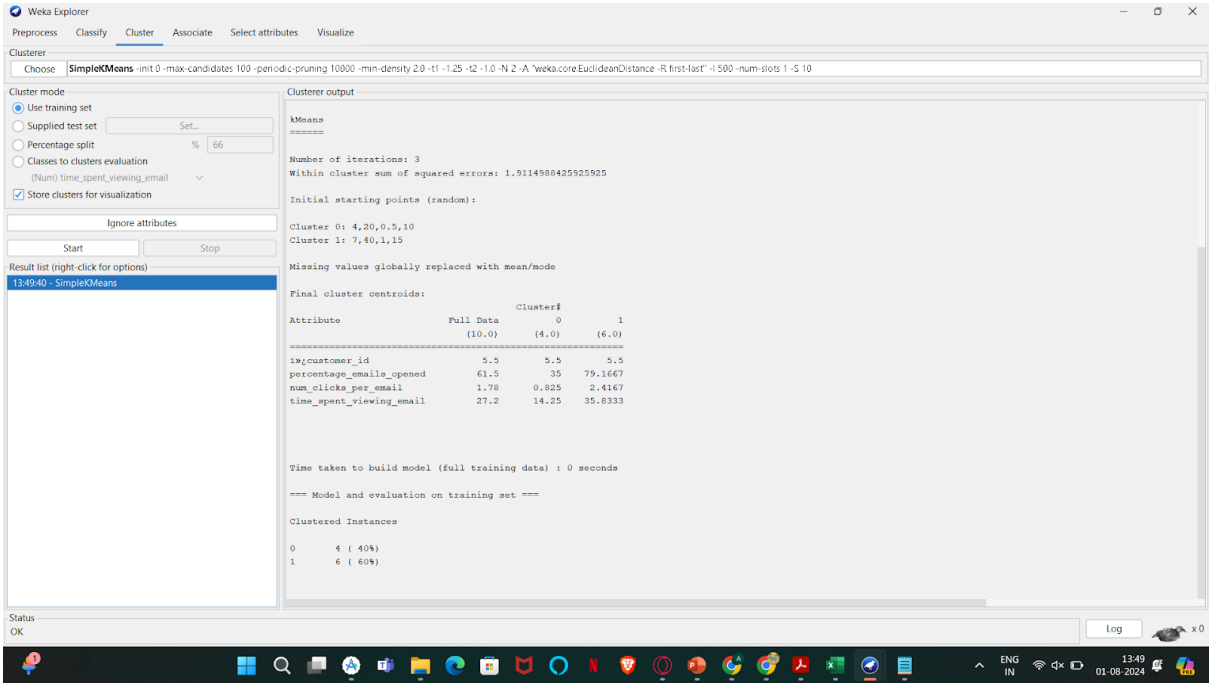
15. Consider a Binary classification model that can be used to predict whether one or more ads on the website will be clicked or not. The models are used to optimize the ad inventory on websites by selecting which ads will have a better chance of being clicked.



16. Consider that Many businesses use cluster analysis to identify consumers who are similar to each other so they can tailor their emails sent to consumers in such a way that maximizes their revenue. Consider a business may collect the following information about consumers

- **Percentage of emails opened**
- **Number of clicks per email**
- **Time spent viewing email**

Using these metrics, a business can perform various cluster analyses to identify consumers who use email in similar ways and tailor the types of emails and frequency of emails they send to different clusters of customers. Compare the performance of the applied clustering algorithm.

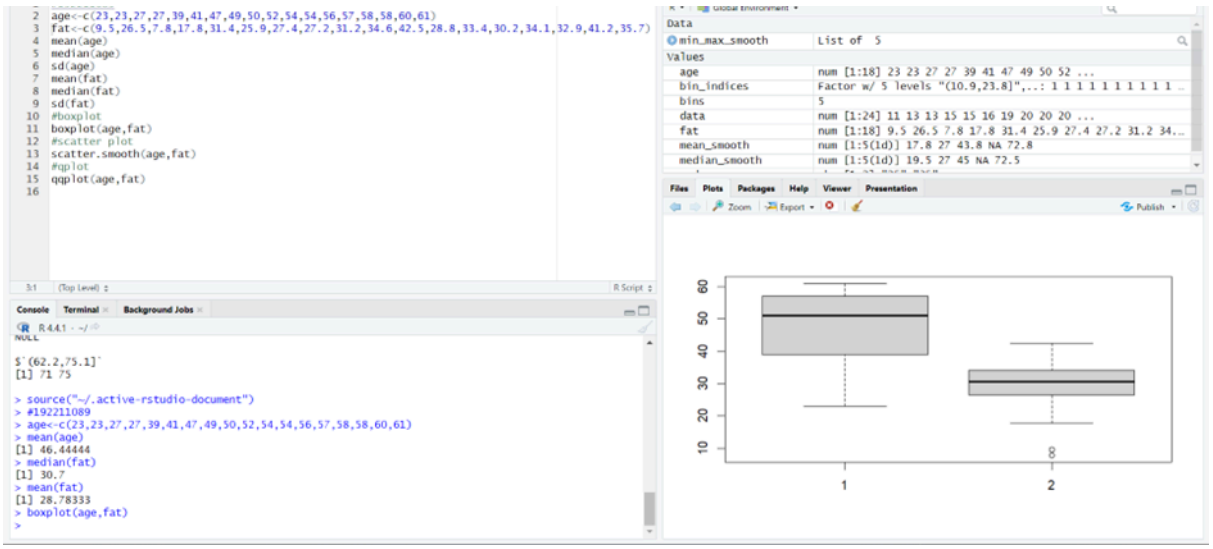


17. Suppose that a hospital tested the age and body fat data for 18 randomly selected adults with the following results:

age	23	23	27	27	39	41	47	49	50
%fat	9.5	26.5	7.8	17.8	31.4	25.9	27.4	27.2	31.2
age	52	54	54	56	57	58	58	60	61
%fat	34.6	42.5	28.8	33.4	30.2	34.1	32.9	41.2	35.7

(a) Calculate the mean, median, and standard deviation of *age* and *%fat*.
(b) Draw the boxplots for *age* and *%fat*.
(c) Draw a *scatter plot* and a *q-q plot* based on these two variables.

Perform the above functions using R – tool



18. Suppose that a hospital tested the age and body fat data for 18 randomly selected adults with the following results:

age	23	23	27	27	39	41	47	49	50
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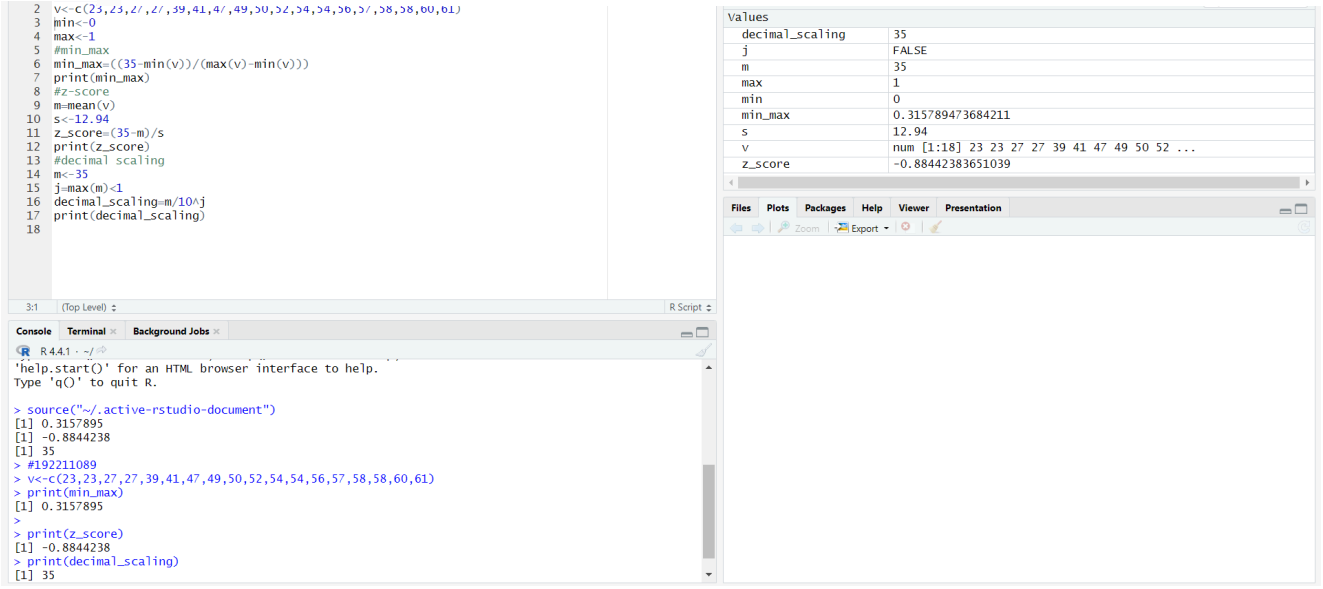
age	52	54	54	56	57	58	58	60	61
%fat	34.6	42.5	28.8	33.4	30.2	34.1	32.9	41.2	35.7

(i) Use min-max normalization to transform the value 35 for *age* onto the range [0.0, 1.0].

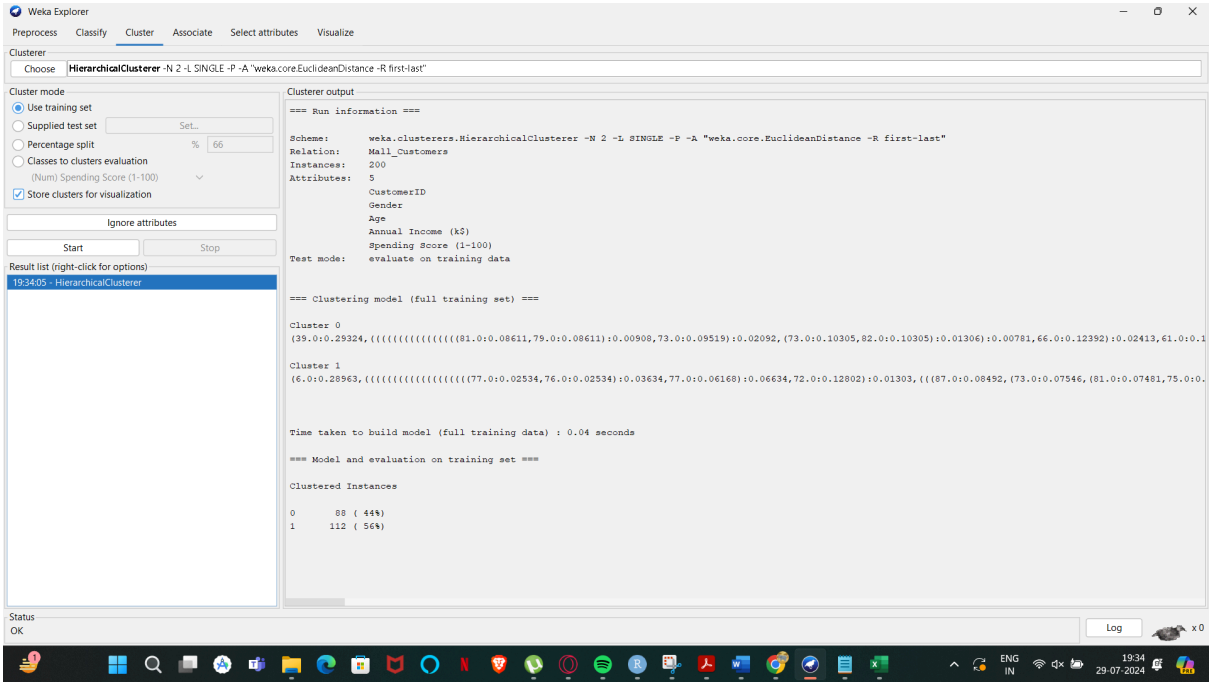
(ii) Use z-score normalization to transform the value 35 for *age*, where the standard deviation of *age* is 12.94 years.

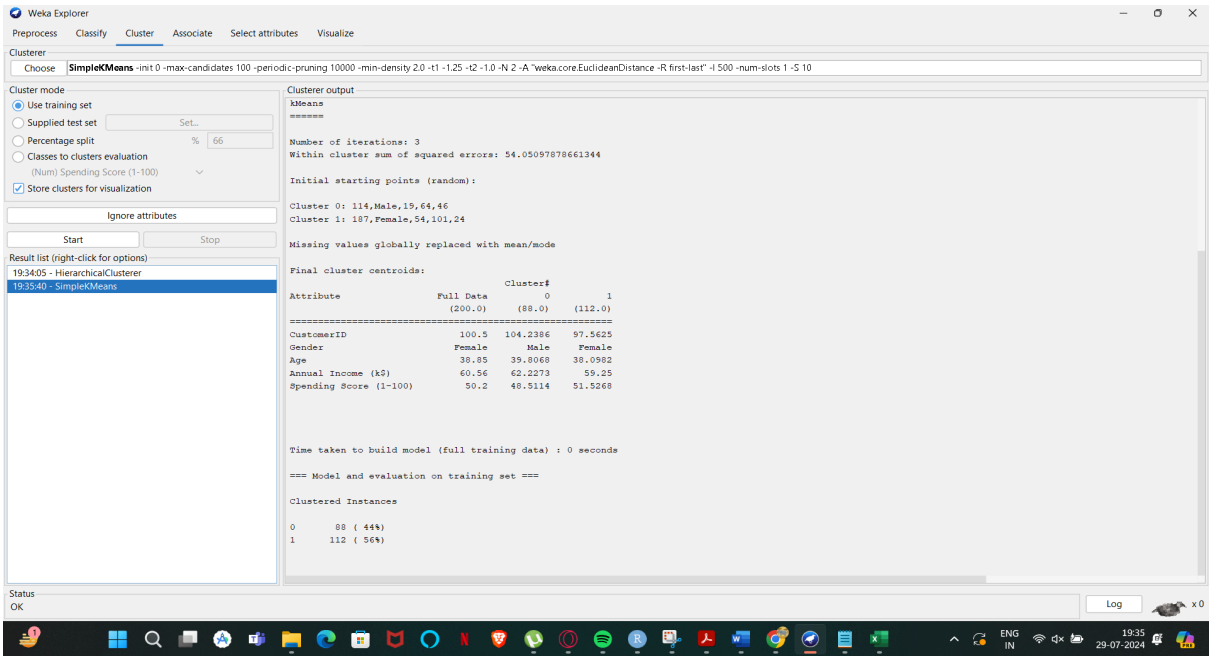
(iii) Use normalization by decimal scaling to transform the value 35 for *age*.

Perform the above functions using R – tool



19. Consider that you are owning a supermarket mall and through membership cards, you have some basic data about your customers like Customer ID, age, gender, annual income and spending score. For the above scenario, the Problem Statement was You want to understand the customers who can easily converge [Target Customers] so that the data can be given to the marketing team and plan the strategy accordingly. For the above scenario prepare a dataset and perform Clustering Analysis to segment the customers in the Mall. There are clearly Five segments of Customers based on their Annual Income and Spending Score namely Usual Customers, Priority Customers, Senior Citizen Target Customers, and Young Target Customers.Sample data

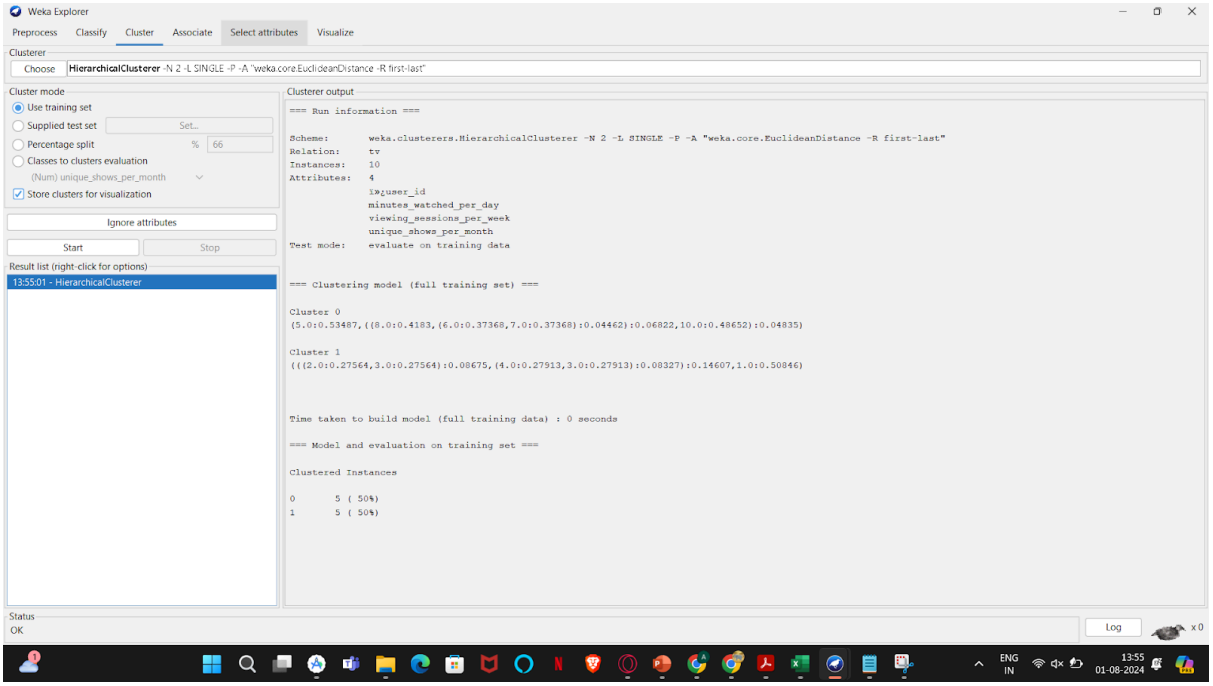




20. Streaming services often use clustering analysis to identify viewers who have similar behavior. The streaming service may collect the following data about individuals

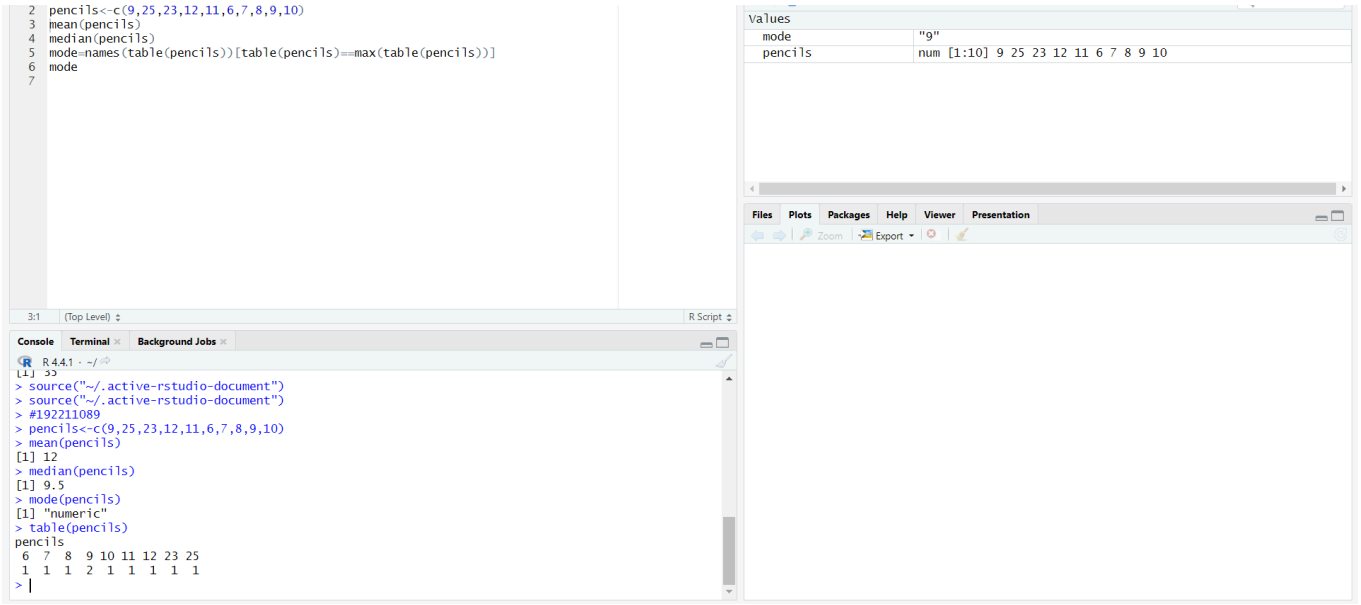
- **Minutes watched per day**
- **Total viewing sessions per week**
- **Number of unique shows viewed per month**

Using these metrics, a streaming service can perform cluster analysis to identify high-usage and low-usage users so that they can know whom they should spend most of their advertising dollars on. Apply the Hierarchical clustering algorithm and EM clustering algorithm to identify and compare the performance of the clustering technique.

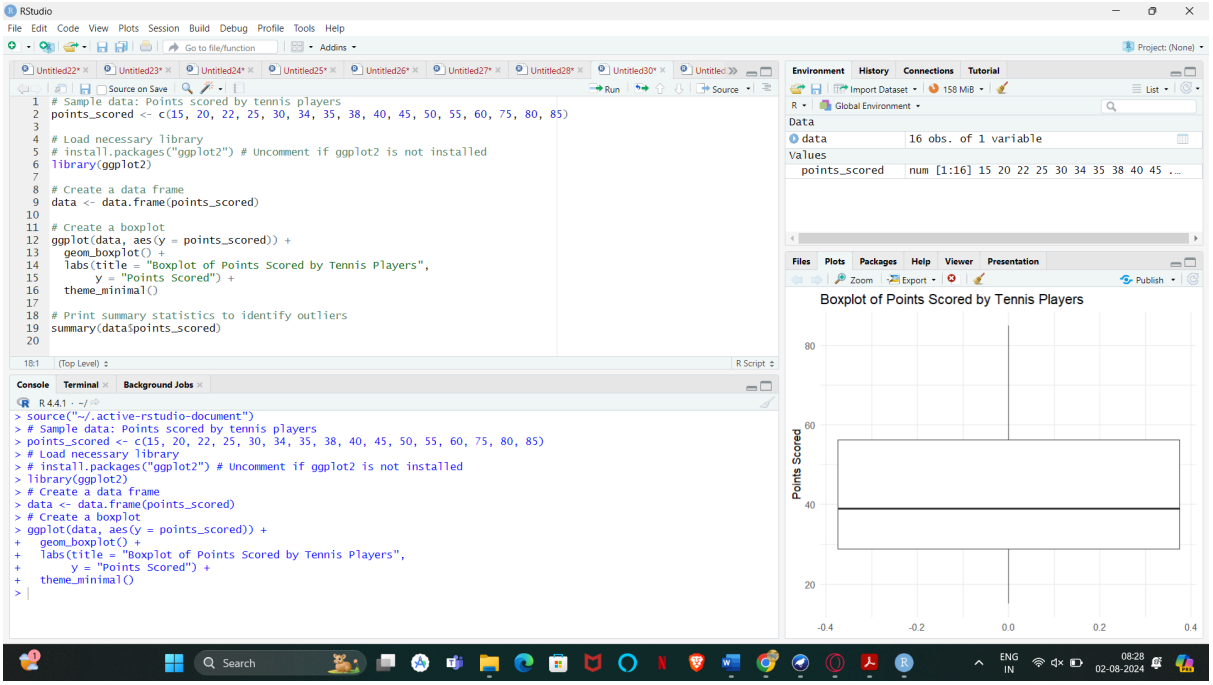


21. The following values are the number of pencils available in the different boxes. Create avector and find out the mean, median and mode values of set of pencils in the given data.

Box1	Box2	Box3	Box4	Box5	Box6	Box7	Box8	Box9
25	23	12	11	6	7	8	9	10

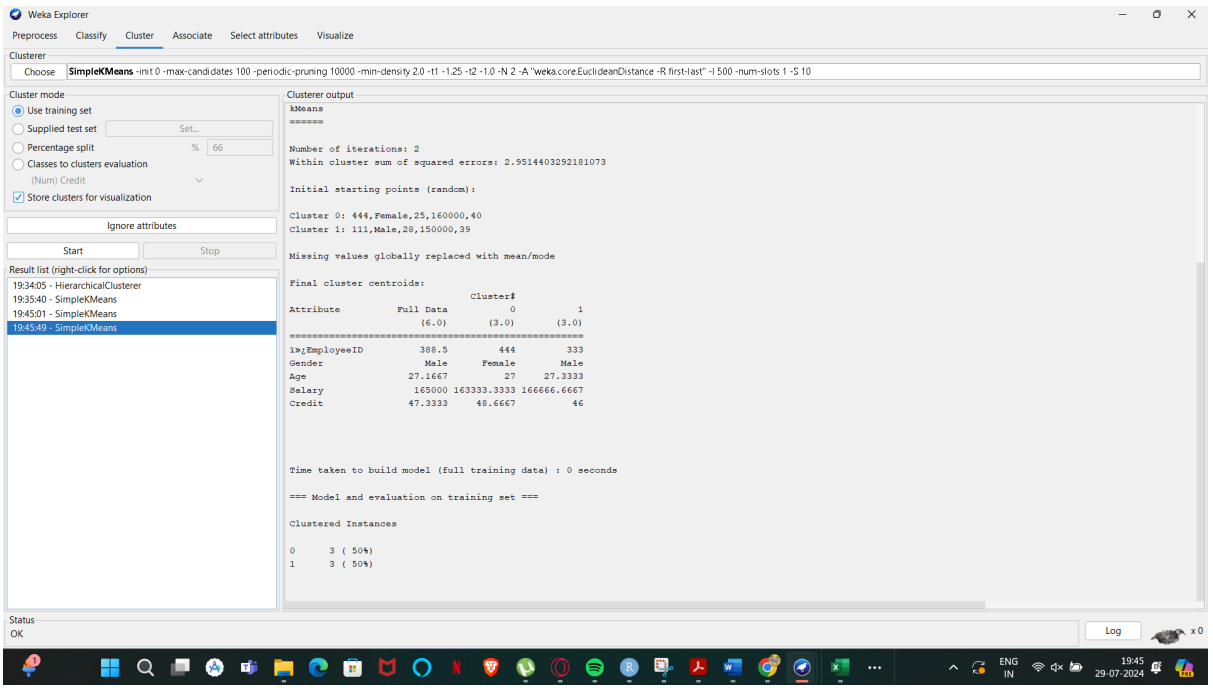


22. Assume the Tennis coach wants to determine if any of his team players are scoring outliers. To visualize the distribution of points scored by his players, then how can he decide to develop the box plot? Give suitable example using Boxplot visualization technique.

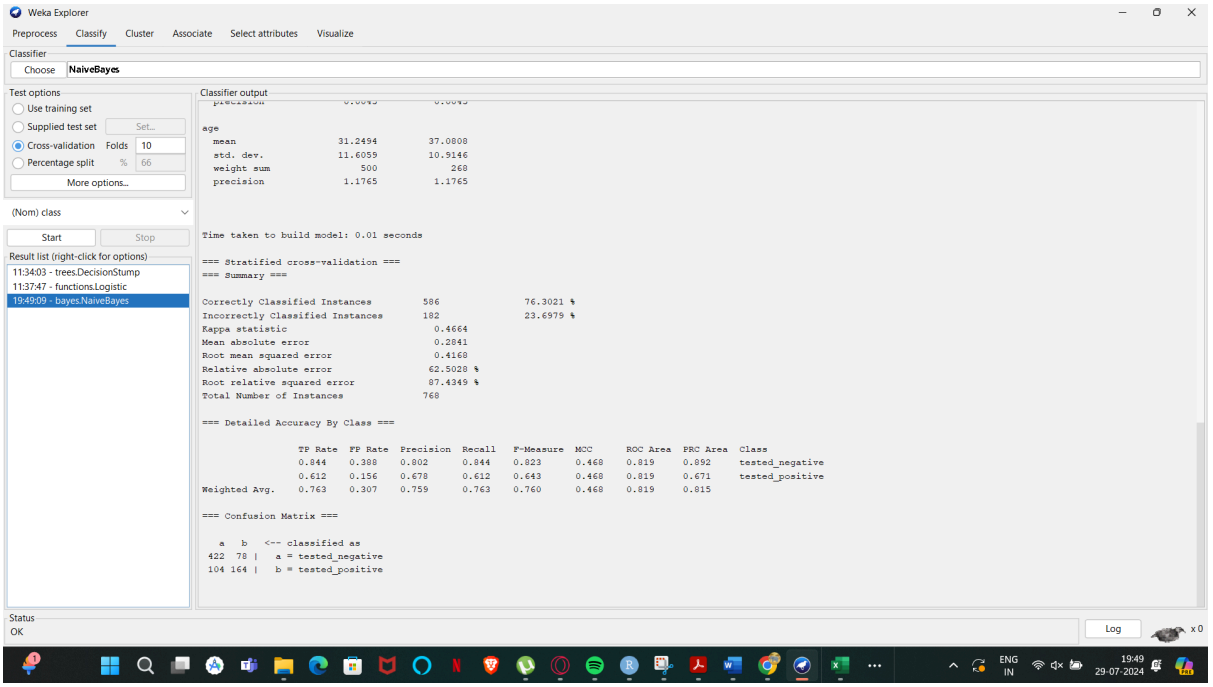


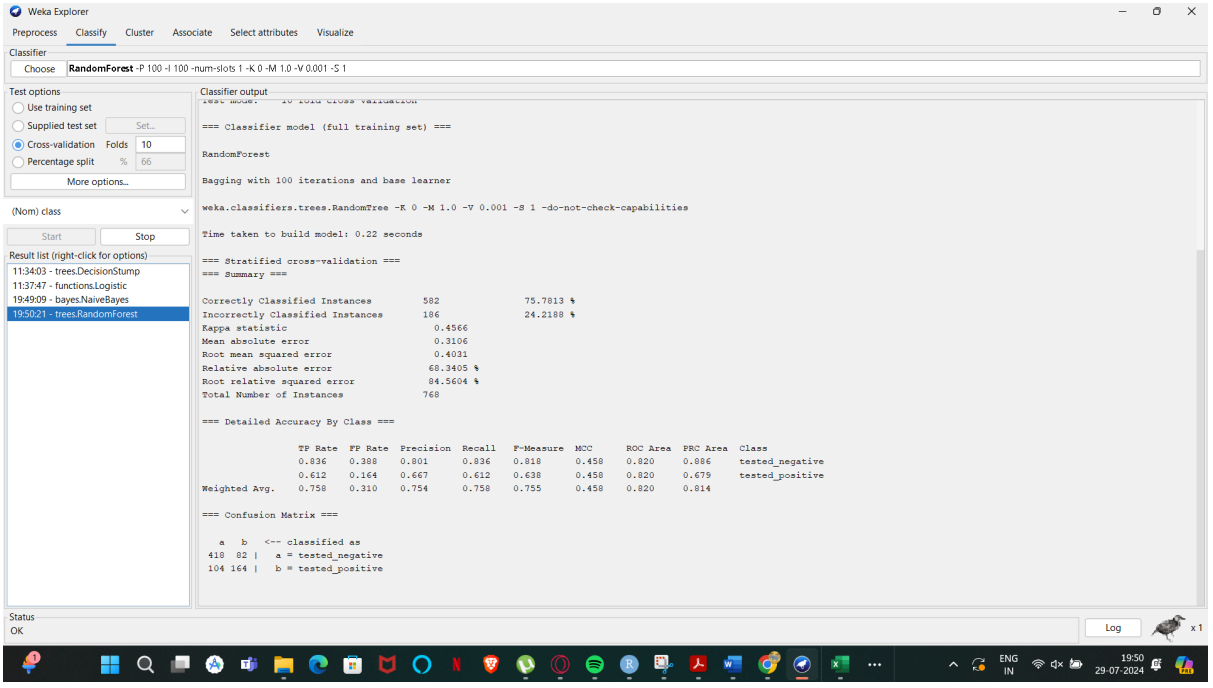
23. Create the following dataset using CSV file format. To perform cluster analysis using K- Means in WEKA. To change the cluster size and plot the graph and illustrate the visualization of cluster.

EmployeID	Gender	Age	Salary	Credit
111	Male	28	150000	39
222	Male	25	150000	27
333	Female	26	160000	42
444	Female	25	160000	40
555	Female	30	170000	64
666	Male	29	200000	72



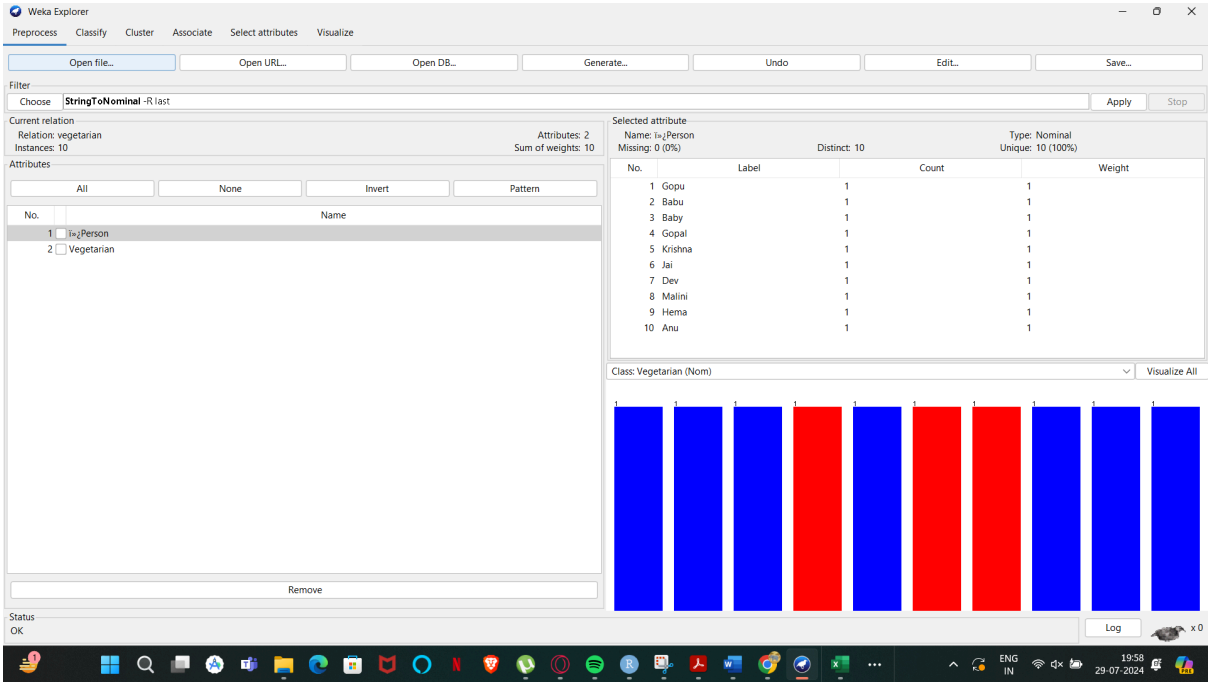
24. Prediction of categorical data using Naïve Bayes classification through WEKA using any datasets. Compare the Naïve Bayes algorithm with SVM using the summary of results given by the classifiers and plot the graph.

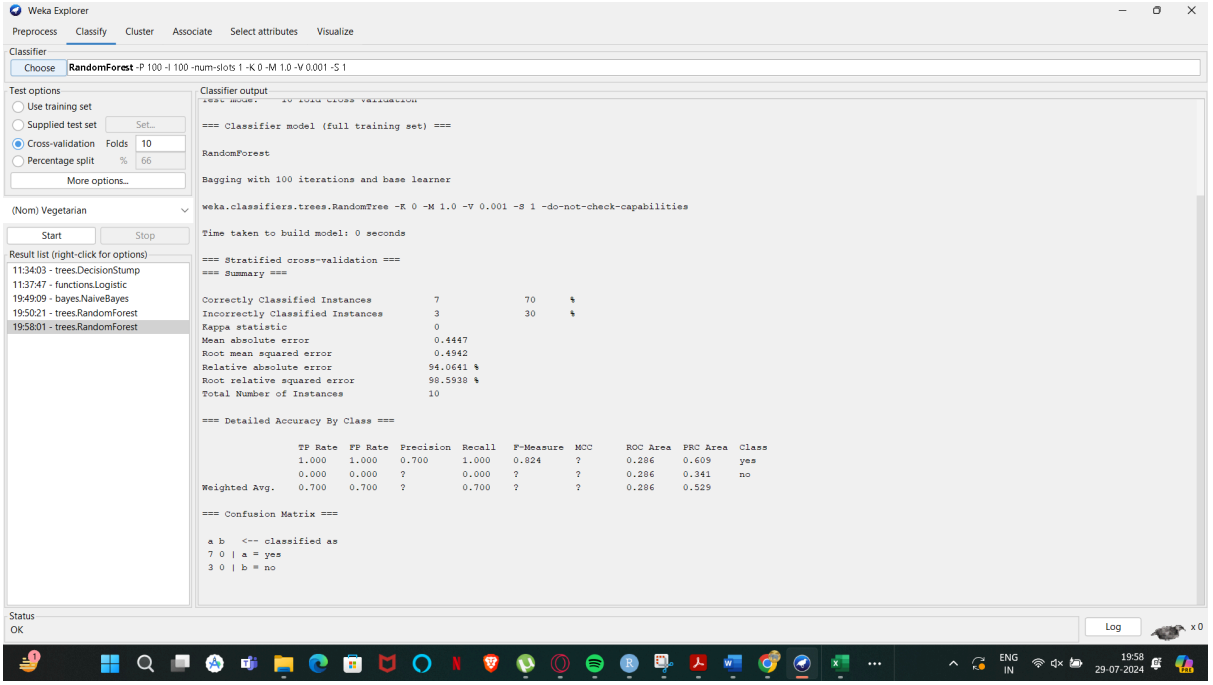




25. The following list of persons with vegetarian or not details given in the table. How will you find out how many of them are vegetarian and how many of them are non-vegetarian? Which type of the person total count is greater value?

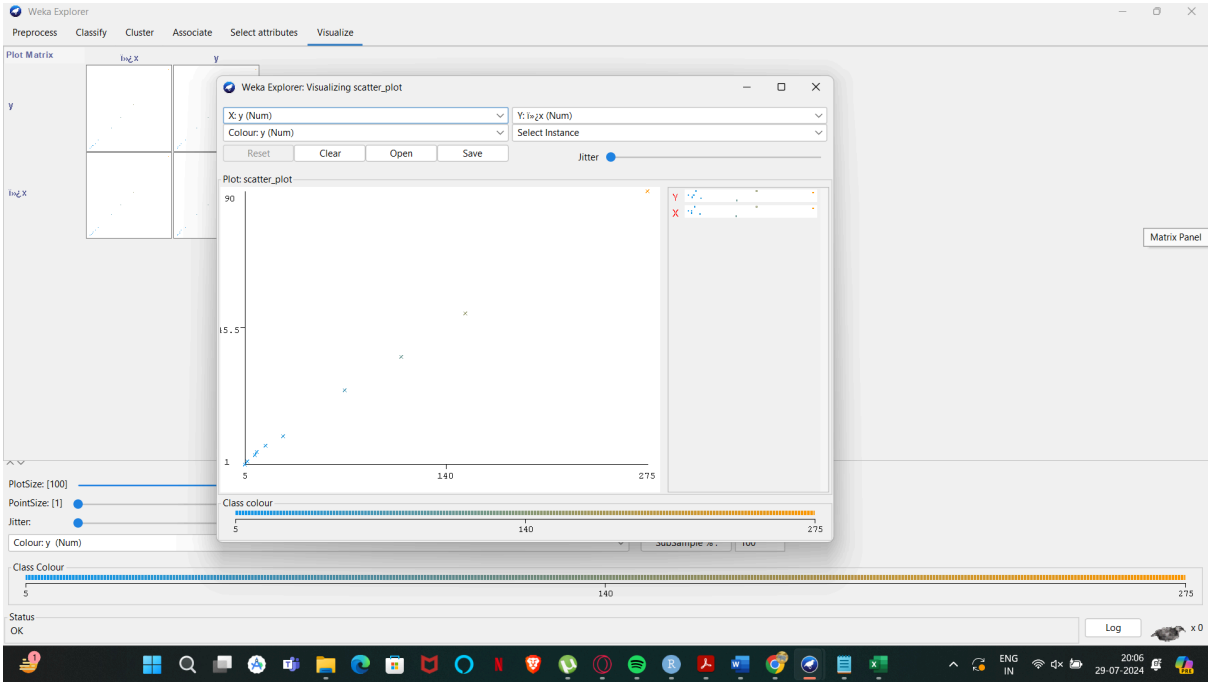
Person	Gopu	Babu	Baby	Gopal	Krishna	Jai	Dev	Malini	Hema	Anu
Vegetarian	yes	yes	yes	no	yes	no	no	yes	yes	yes





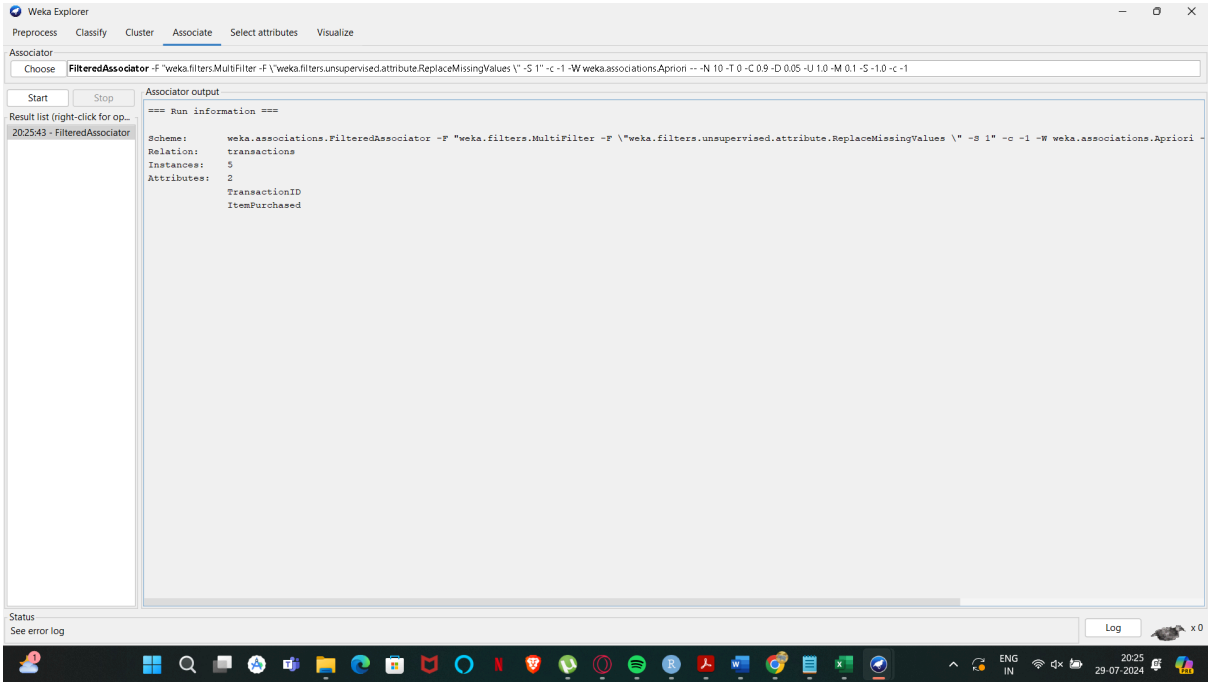
26.The following table would be plotted as (x,y) points, with the first column being the x values as number of mobile phones sold and the second column being the y values as money. To use the scatter plot for how many mobile phones sold.

x	4	1	5	7	10	2	50	25	90	36
y	12	5	13	19	31	7	153	72	275	110

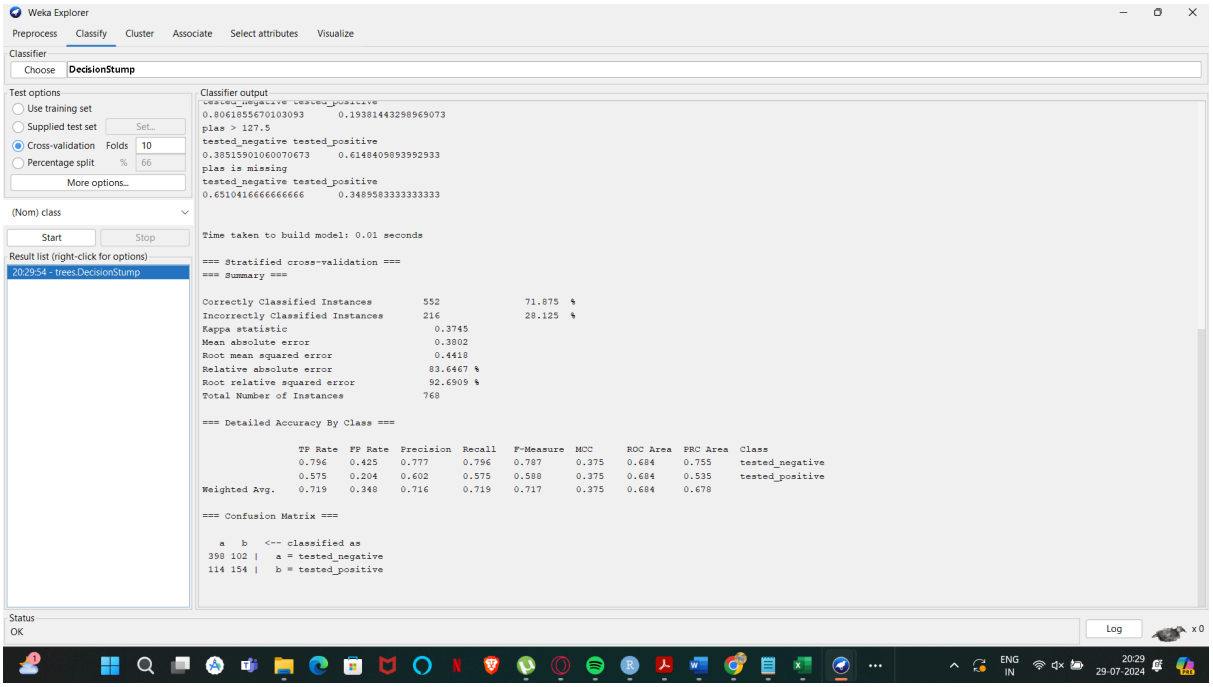


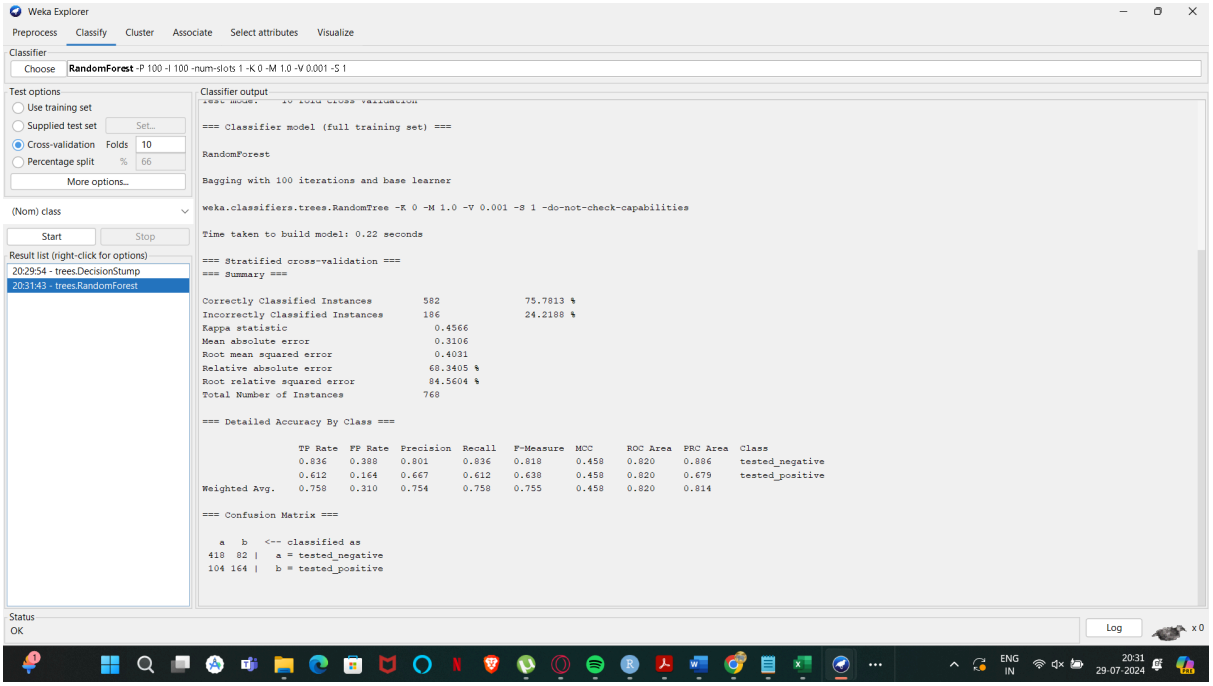
27. Generate rules using FP growth algorithm using the given dataset which has the following transactions with items purchased: Consider the values as support=50% and confidence=75%.

Transaction ID	Items Purchased
1	Bread, Cheese, Egg, Juice
2	Bread, Cheese, Juice
3	Bread, Milk, Yogurt
4	Bread, Juice, Milk
5	Cheese, Juice, Milk



28. Prediction of Diabetes Data using Decision tree classifier in WEKA. Compare it with Support Vector Machine classifier. Show the result accuracy and F1 measure calculation .Plot the graph and explain the summary of results.



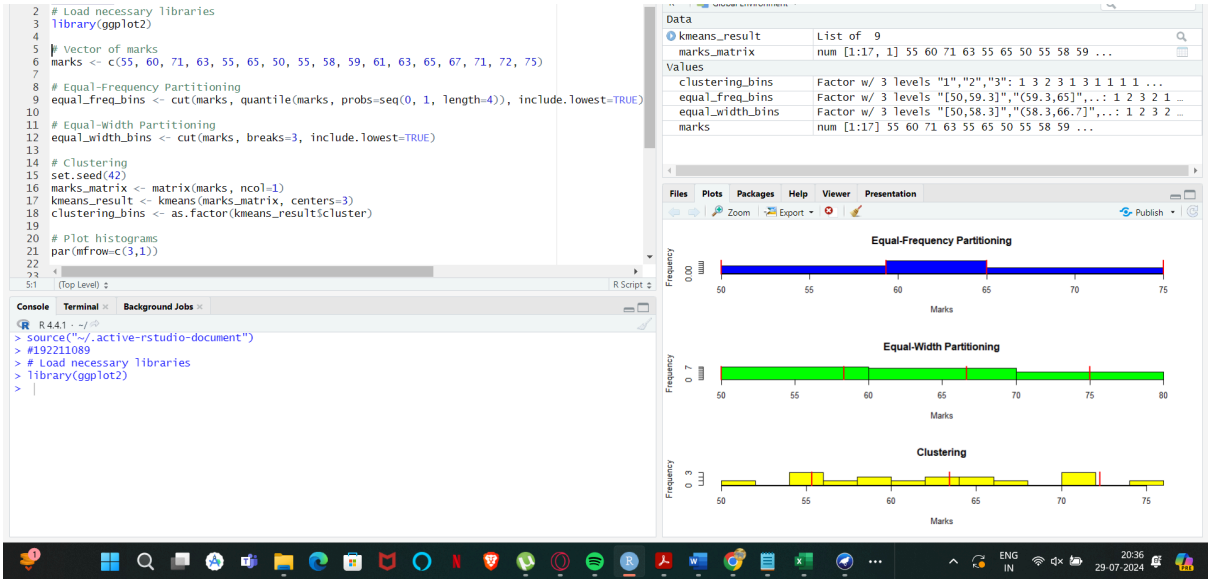


29. Implement of the R script using marks scored by a student in his model exam has been sorted as follows: 55, 60, 71, 63, 55, 65, 50, 55,58,59,61,63,65,67,71,72,75. Partition them into three bins by each of the following methods. Plot the data points using histogram.

(a) equal-frequency (equi-depth) partitioning

(b) equal-width partitioning

(c) clustering

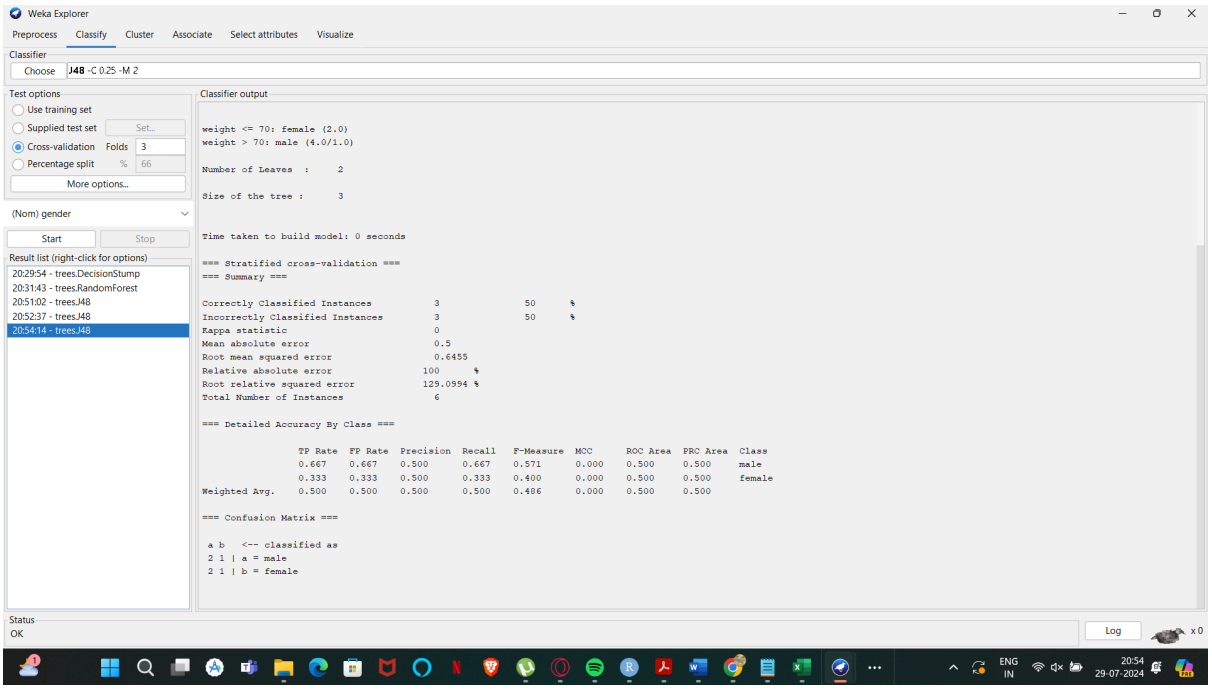


30. Consider this Decision tree :

a)create the data set for the below tree using ARFF format and calculate accuracy and decision for the same

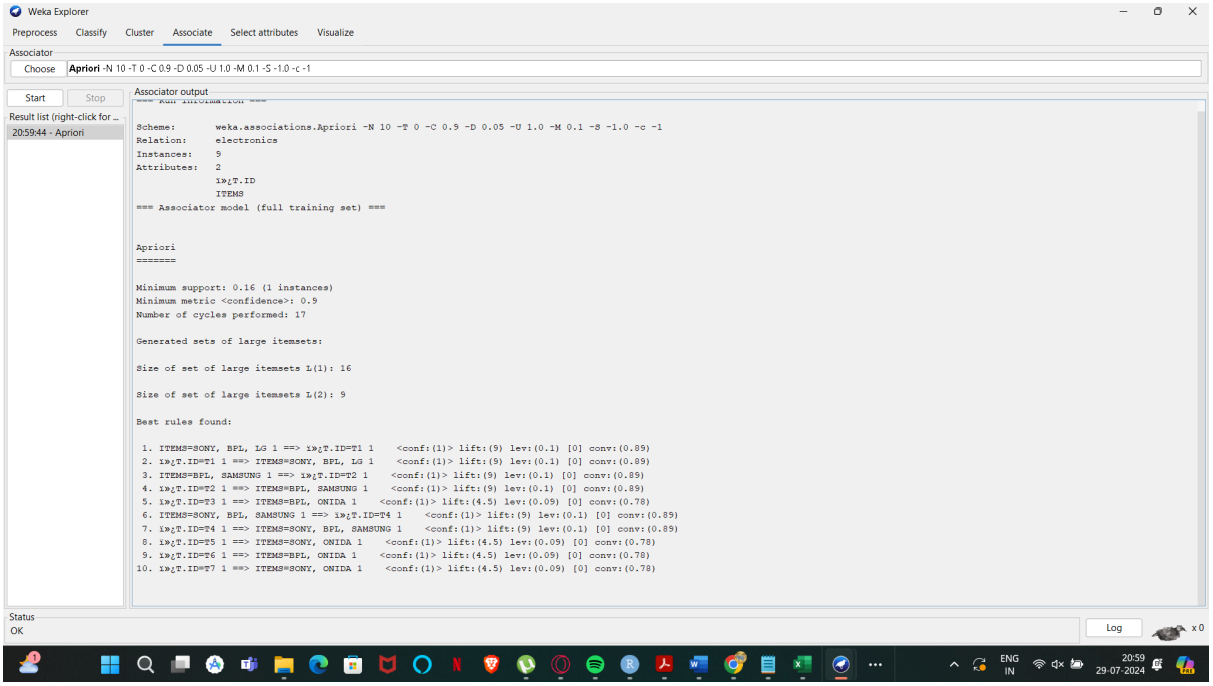
b) Using this decision tree generate the rules based on rule based induction.

c) Compare both the algorithms and plot the confusion matrix.



31. Create an ARFF file for the table below and implement for the Apriori Algorithm and FP growth algorithm and compare the rules generated by both the algorithms. Identify the unique rules generated by the above algorithms.

T.ID	ITEMS
T1	SONY, BPL, LG
T2	BPL, SAMSUNG
T3	BPL, ONIDA
T4	SONY, BPL, SAMSUNG
T5	SONY, ONIDA
T6	BPL, ONIDA
T7	SONY, ONIDA
T8	SONY, BPL, ONIDA, LG
T9	SONY, BPL, ONIDA



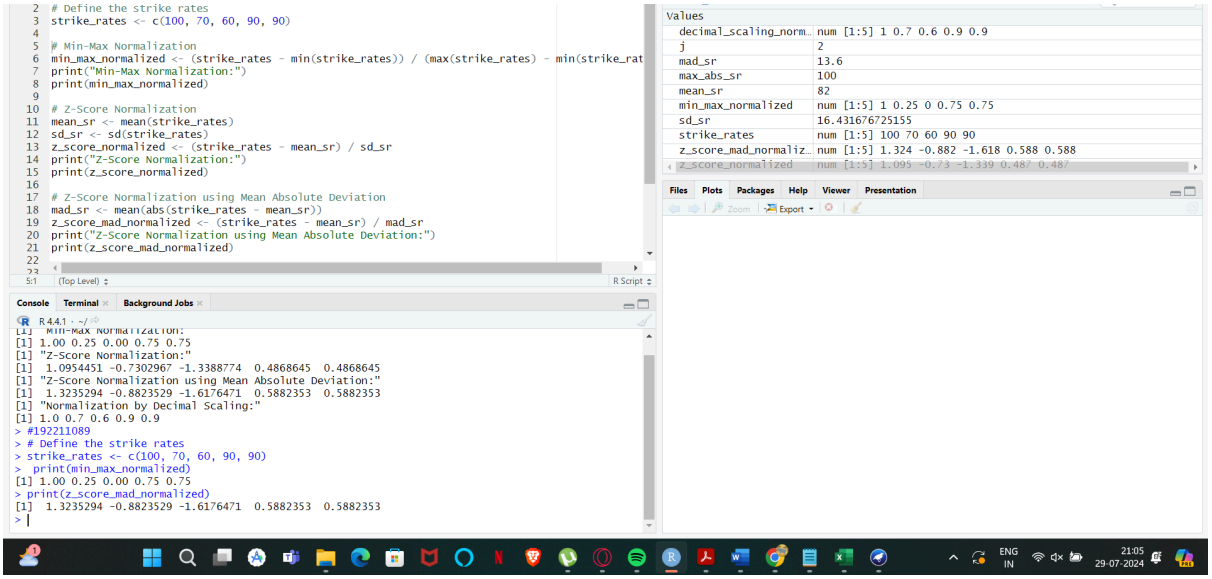
32. The given are the strike-rates scored by a batsman in season 1 in different tournaments. 100, 70, 60, 90, 90

(a) min-max normalization by setting min = 0 and max = 1

(b) z-score normalization

(c) z-score normalization using the mean absolute deviation instead of standard deviation

(d) normalization by decimal scaling

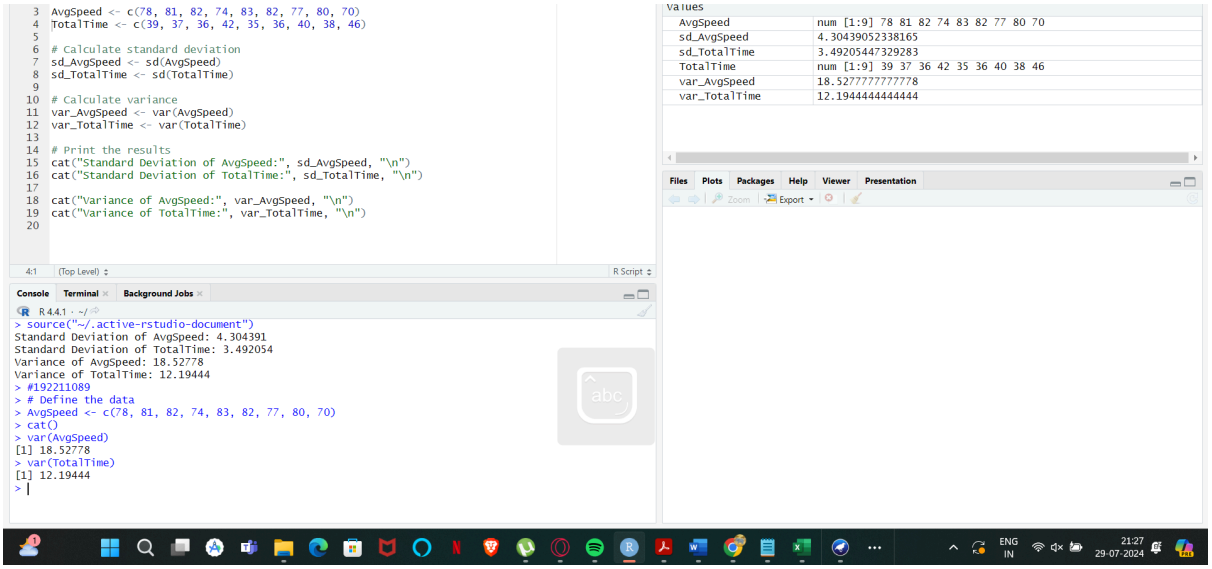


33. Suppose some car is tested for the AvgSpeed and TotalTime data for 9 randomly selected car with the following result

a) Calculate the standard deviation of AvgSpeed and TotalTime.

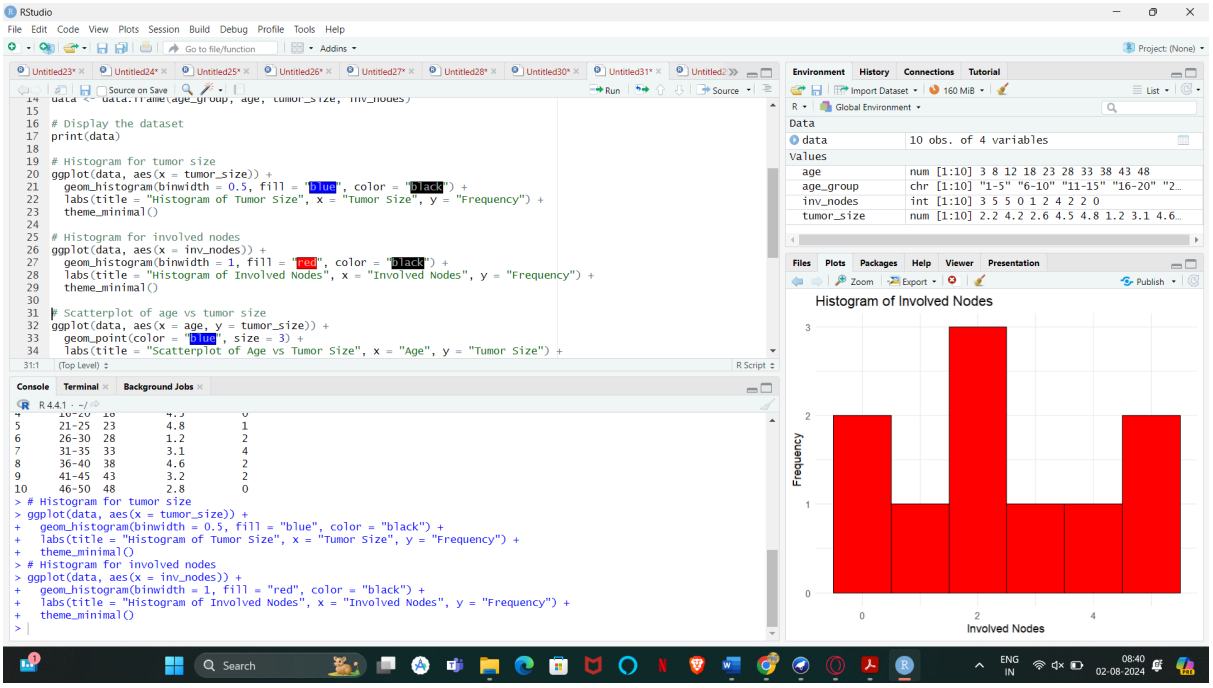
b) Calculate the Variance of AvgSpeed and TotalTime for the above dataset.

AvgSpeed (in kph)	**78**	**81**	**82**	**74**	**83**	**82**	**77**	**80**	**70**
TotalTime (in mins)	**39**	**37**	**36**	**42**	**35**	**36**	**40**	**38**	**46**



34. Consider a person want to take a censes / plot for the breast-cancer affected people through the years.Create a own dataset with this parameters age, tumorsize,inv-nodes [example between age 1-5 = no.of.count, 6-10=no.of.count,etc]

Draw the Histogram, scatterplot,boxplot.



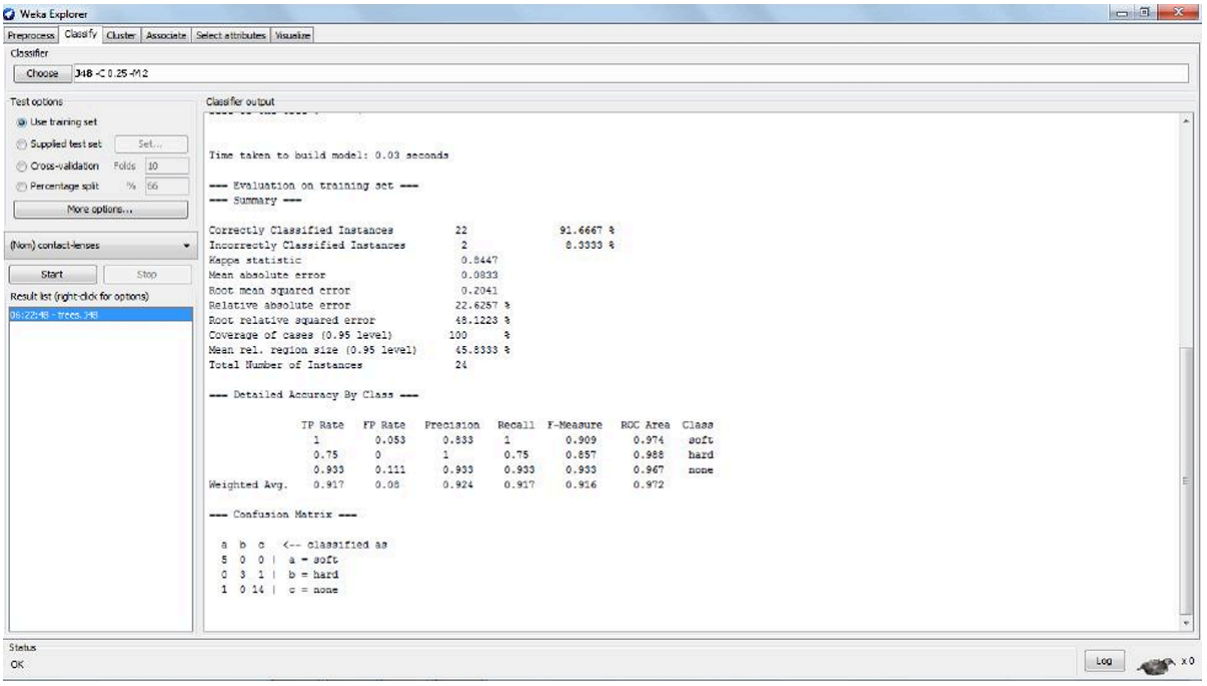
35. Create the Confusion matrix using this scenario:
A shepherd boy gets bored tending the town's flock. To have some fun, he cries out, "Wolf!" even though no wolf is in sight. The villagers run to protect the flock, but then get really mad when they realize the boy was playing a joke on them.One night, the shepherd boy sees a real wolf approaching the flock and calls out, "Wolf!" The villagers refuse to be fooled again and stay in their houses. The hungry wolf turns the flock into lamb chops. The town goes hungry. Panic ensues.

True Positive (TP): • Reality: A wolf threatened. • Shepherd said: "Wolf." • Outcome: Shepherd is a hero.	False Positive (FP): • Reality: No wolf threatened. • Shepherd said: "Wolf." • Outcome: Villagers are angry at shepherd for waking them up.
False Negative (FN): • Reality: A wolf threatened. • Shepherd said: "No wolf." • Outcome: The wolf ate all the sheep.	True Negative (TN): • Reality: No wolf threatened. • Shepherd said: "No wolf." • Outcome: Everyone is fine.

36. Create the ARFF data set for the below mentioned dataset perform the bayes theorem in addition to that compare the same with decision tree. identify the effiecient classifier with accuracy with F1 Score.

PlayTennis: training examples

Day	Outlook	Temperature	Humidity	Wind	PlayTennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

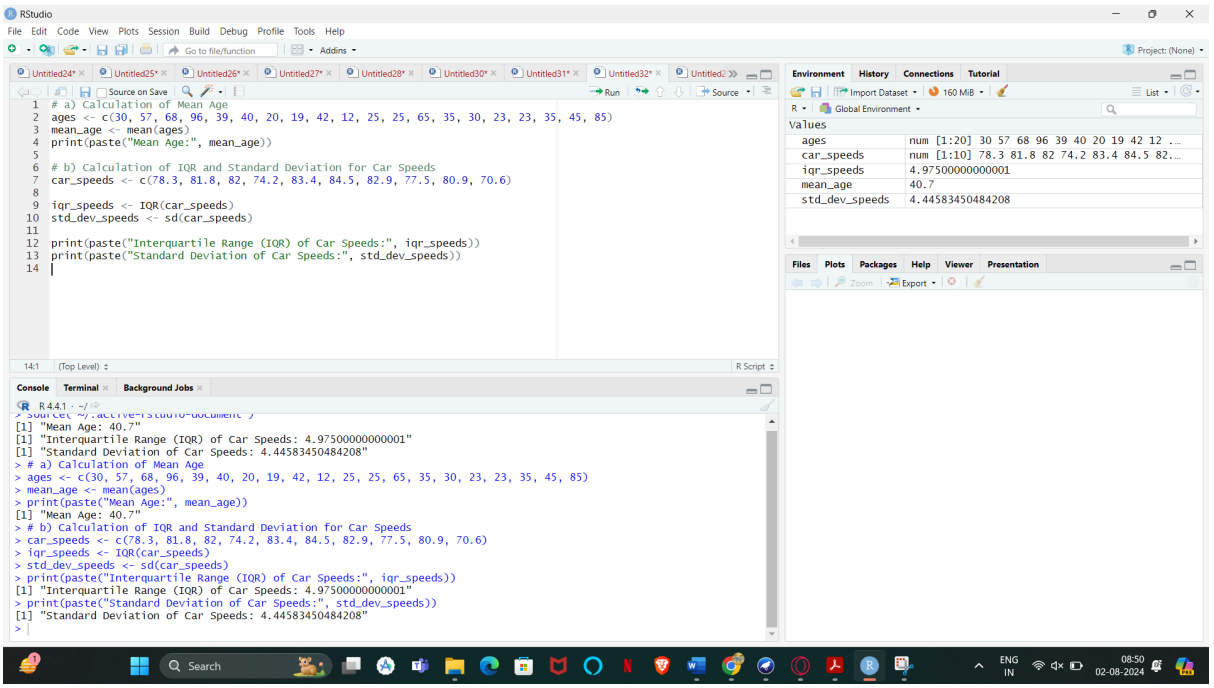


37.

a) Suppose that the "Diabetes data set " data for analysis includes the attribute age. The age values for the data are (in increasing order) 30, 57, 68, 96, 39, 40, 20, 19, 42, 12, 25, 25, 65, 35, 30, 23, 23, 35, 45, 85. What is the mean?

b) Suppose that the speed car is mentioned in different driving style.

Regular Speed	78.3	81.8	82	74.2	83.4	84.5	82.9	77.5	80.9	70.6

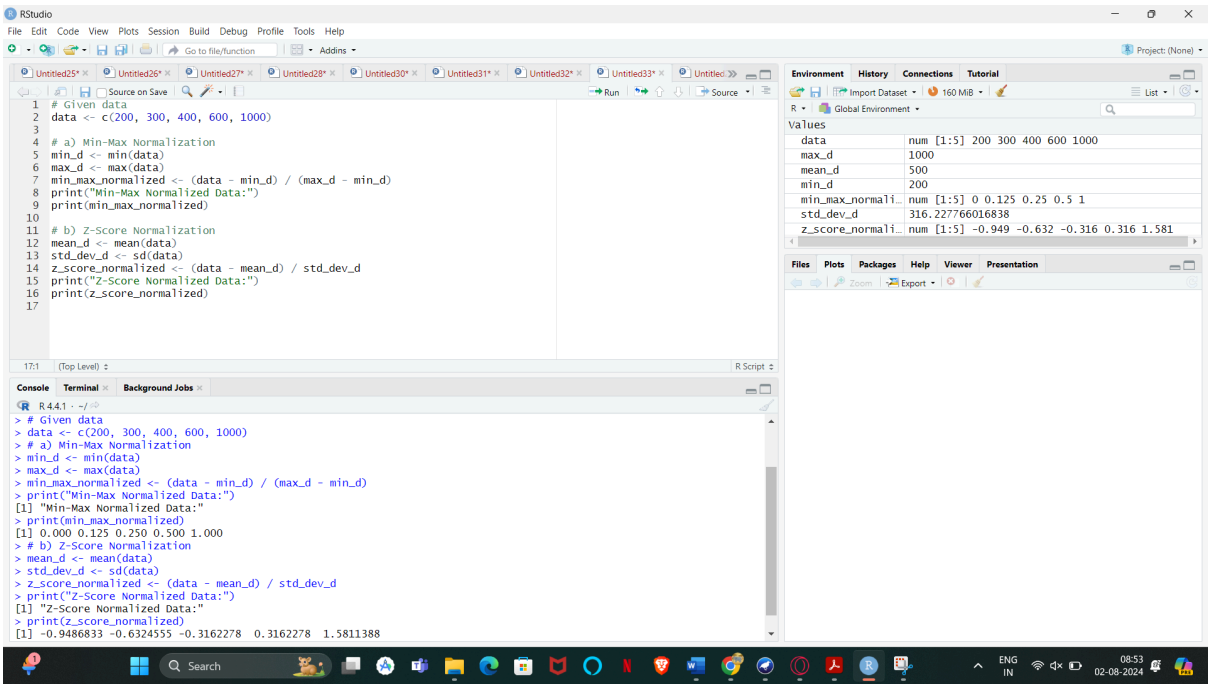


38) a)Let us consider one example to make the calculation method clear. Assume that the minimum and maximum values for the feature F are $50,000 and $100,000 correspondingly. It needs to range F from 0 to 1. In accordance with min-max normalization, v = $80,

a) Use the two methods below to normalize the following group of data: 200, 300, 400, 600, 1000

b) min-max normalization by setting min = 0 and max = 1

c) z-score normalization



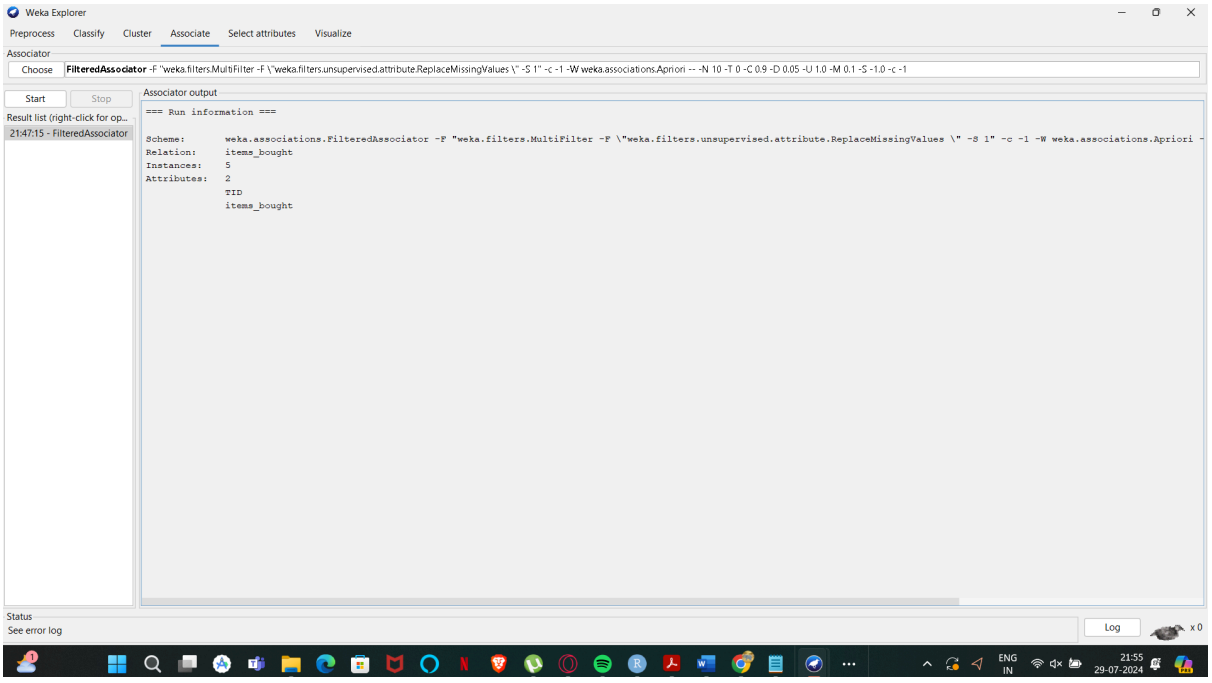
39. Consider this table

TID	items bought
T100	{M, O, N, K, E, Y}
T200	{D, O, N, K, E, Y }
T300	{M, A, K, E}
T400	{M, U, C, K, Y}
T500	{C, O, O, K, I ,E}

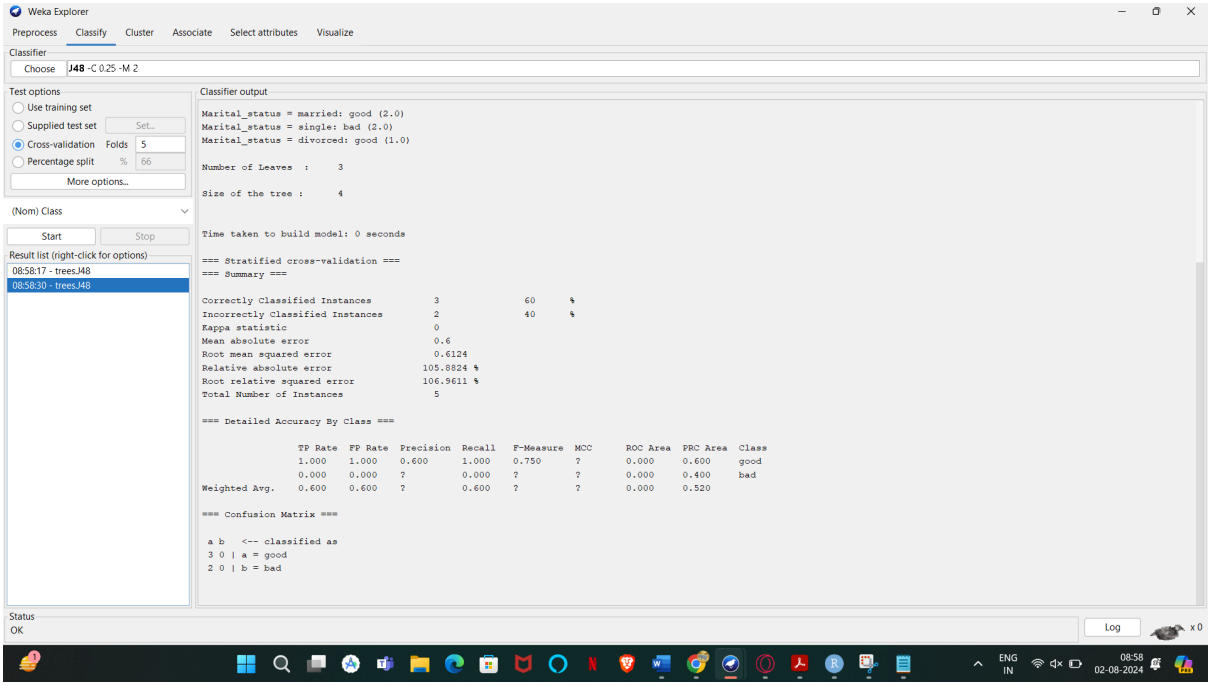
(a) Find all frequent item set using Apriori and FP-growth, respectively. Compare the efficiency of the two mining processes.

(b) List all of the strong association rules (with support s and confidence c) matching the following metarule, where X is a variable representing customers, and itemi denotes variables representing items (e.g., "A", "B", etc.):

$\forall x \in$ transaction, buys(X, item1) $\wedge$ buys(X, item2) $\Rightarrow$ buys(X, item3)



40. Suppose we want to classify potential bank customers as good creditors or bad creditors for loan applications. We have a training dataset describing past customers using the following attributes: Marital status {married, single, divorced}, Gender {male, female}, Age {[18..30[, [30..50[, [50..65[, [65+]}, Income {[10K..25K[, [25K..50K[, [50K..65K[, [65K..100K[, [100K+]}. Using Weka tool solve this problem.


Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Classifier
Choose
J48 -C 0.25 -M 2
Test options
Use training set
Supplied test set
Set...
Cross-validation
Folds
5
Percentage split
%
66
More options...
(Nom) Class
Start
Stop
Result list (right-click for options)
08:58:17 - trees.J48
08:58:30 - trees.J48
Classifier output
Marital_status = married: good (2.0)
Marital_status = single: bad (2.0)
Marital_status = divorced: good (1.0)
Number of Leaves : 3
Size of the tree : 4
Time taken to build model: 0 seconds
=== Stratified cross-validation ===
=== Summary ===
Correctly Classified Instances 3 60 %
Incorrectly Classified Instances 2 40 %
Kappa statistic 0
Mean absolute error 0.6
Root mean squared error 0.6124
Relative absolute error 105.8824 %
Root relative squared error 106.9611 %
Total Number of Instances 5
=== Detailed Accuracy By Class ===
TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class
1.000 1.000 0.600 1.000 0.750 ? 0.000 0.600 good
0.000 0.000 ? 0.000 ? ? 0.000 0.400 bad
Weighted Avg. 0.600 0.600 ? 0.600 ? ? 0.000 0.520
=== Confusion Matrix ===
a b <-- classified as
3 0 | a = good
2 0 | b = bad
Status
OK
Log
x 0
ENG
IN
08:58
02-08-2024