

# Machine Learning Predictions Desktop Application

The application developed is to enable the analysis of business processes that needed by different departments within a company and to make predictions of planned and anticipated targets in the light of the data recorded in the database.

The application analyzes data and produces predictions by using supervised, unsupervised, and regression within the scope of machine learning methods. In this way, it is aimed to produce the most accurate estimates by minimizing the budget, production and shipment expenditure risks.

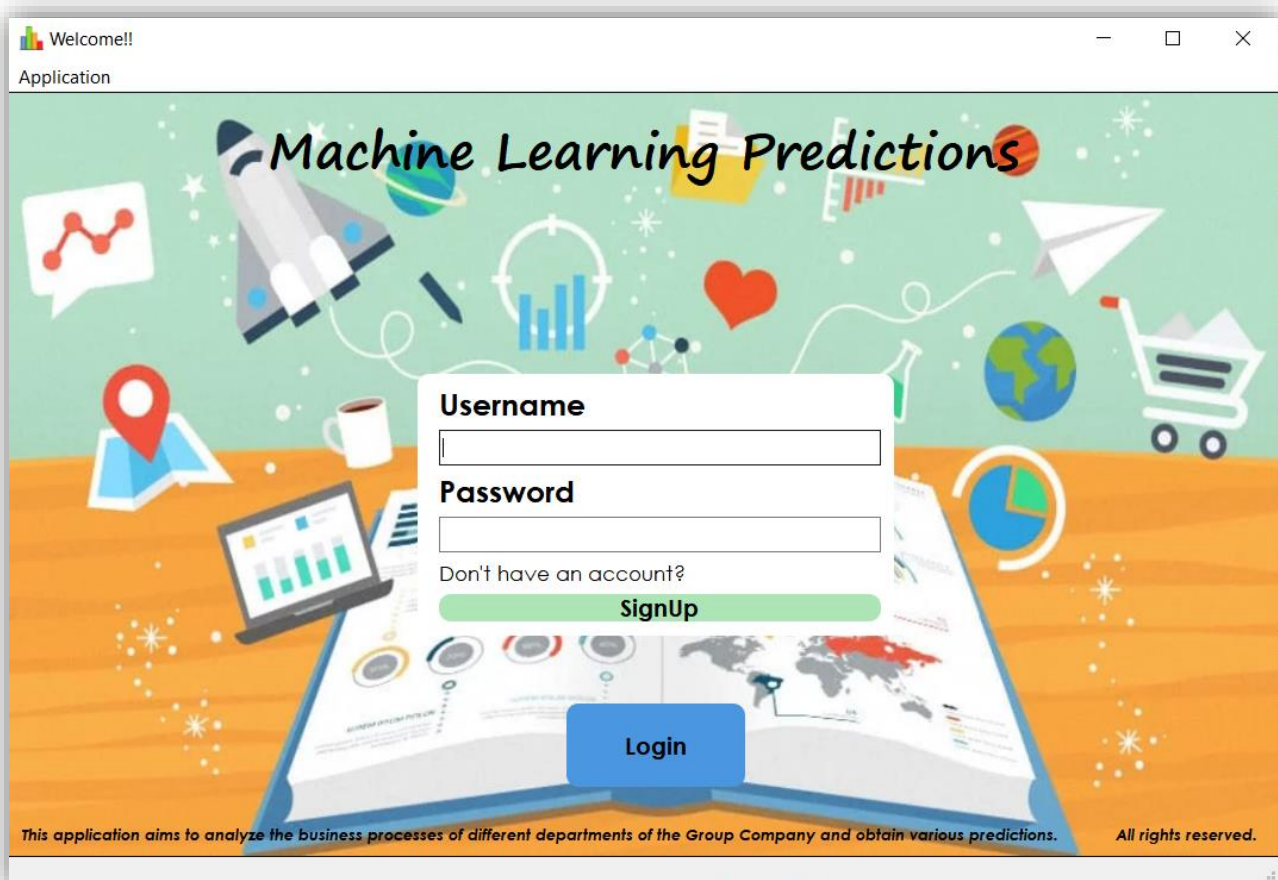
It will enable the company to obtain more effective and productive results in line with the predictions made in the competitive environment in the market.

The resource planning for the future periods and optimum estimates closest to the correct result, it will achieve maximum profit with minimum budget and expenditure.

The fact that experiments and examinations can be carried out faster ensures that R & D can be carried out much faster and more effectively in many sectors and provides higher quality products.

It plays an important role in product market analysis, determination of consumer behavior, determining the factors that determine efficiency and quality in production, determining the best sales, marketing and production methods for companies, and it plays an crucial role in the sustainability of the processes and enables them to be managed with predictable outcomes.

Home screen of the application is as follows. If the user has an account on the login screen, it can be Login with username and password information.



If the user does not have an account, a new user can be registered with the “**SignUp**” button and should fill the new user form below by checking the tooltips of fields otherwise the application will warn the user about the incorrect entry.

The image displays two screenshots of a web application's registration form, titled "Registration".

**Top Screenshot (Empty Form):**

- Comp. Register Number:** Text input field.
- Name:** Text input field.
- Surname:** Text input field.
- Age:** Text input field.
- Department:** Dropdown menu with "Information Systems" selected.
- Username:** Text input field.
- Password:** Text input field.
- e-Mail:** Text input field.
- Mobile Phone:** Text input field.
- Gender:** Radio buttons for "Female" and "Male".
- Buttons:** "Register" (orange) and "Clear" (blue).

**Bottom Screenshot (Filled Form with Error):**

- Comp. Register Number:** AB12
- Name:** JEN
- Surname:** SURA
- Age:** 45
- Department:** Marketing
- Username:** Jsura
- Password:** Ab981
- Gender:** "Male" is selected.
- Buttons:** "Register" (orange) and "Clear" (blue).

**Error Message (Invalid Password!):**

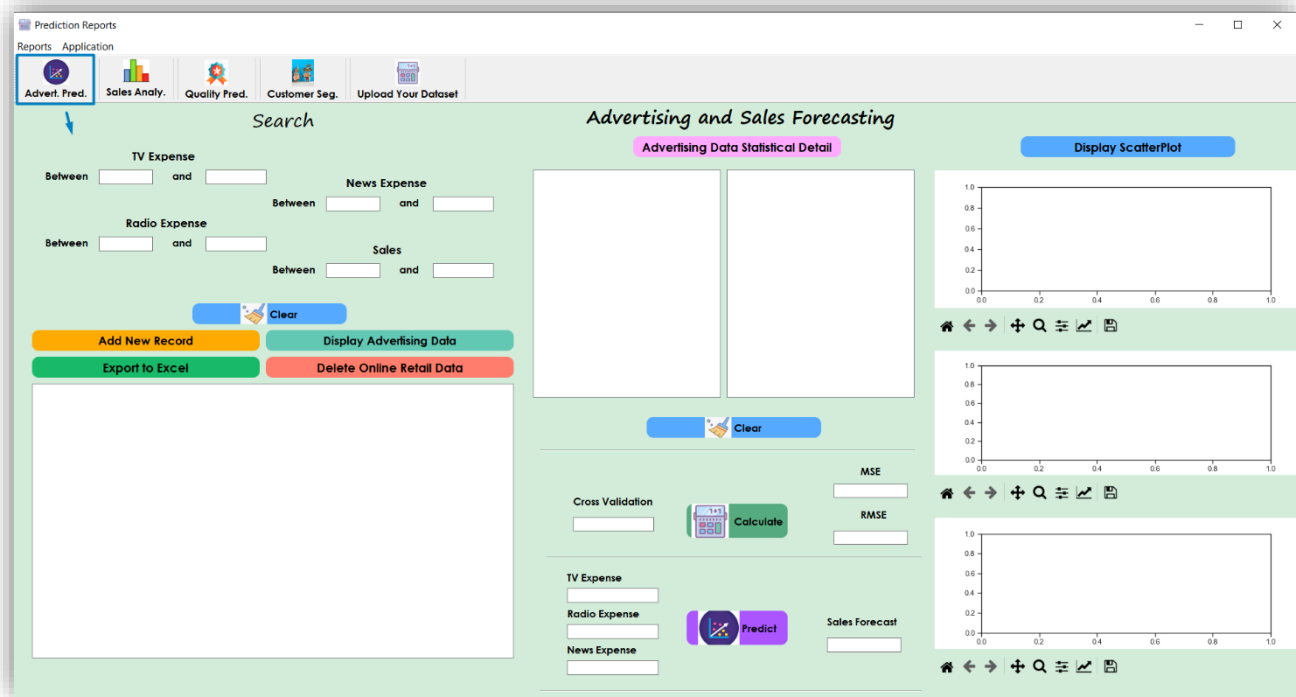
Invalid Password!

Password must contain a number, a lowercase, an uppercase and a special character: such as Ab12\$ and Bf7#

OK

## 1) Advertising and Sales Forecasting

This page contains the advertising expenses data of the advert department in the company.



- All or filtered advertising data can display with the “Display Advertising Data” button.

Add New Record					
Display Advertising Data					
Export to Excel					
Delete Online Retail Data					
	field1	TV	radio	newspaper	sales
0	1.0	230.1	37.8	69.2	22.1
1	2.0	44.5	39.3	45.1	10.4
2	3.0	17.2	45.9	69.3	9.3
3	4.0	151.5	41.3	58.5	18.5
4	5.0	180.8	10.8	58.4	12.9
5	6.0	8.7	48.9	75.0	7.2
6	7.0	57.5	32.8	23.5	11.8
7	8.0	120.2	19.6	11.6	13.2
8	9.0	8.6	2.1	1.0	4.8
9	10.0	199.8	2.6	21.2	10.6

Count:601

- If the user wants to add a new record, can use the “**Add New Record button**” and fill the new advertising record form in the incoming window.

The main application window features a top navigation bar with four buttons: "Add New Record" (orange), "Display Advertising Data" (teal), "Export to Excel" (green), and "Delete Online Retail Data" (red). Below the navigation bar is a table with the following data:

	field1	TV	
0	1.0	230.1	37.8
1	2.0	44.5	39.3
2	3.0	17.2	45.9
3	4.0	151.5	41.3
4	5.0	180.8	10.8
5	6.0	8.7	48.9
6	7.0	57.5	32.8
7	8.0	120.2	19.6
8	9.0	8.6	2.1
9	10.0	199.8	2.6

A modal window titled "Add New Advertising Record" is open, containing the following form fields:

- NUM:
- TV:
- RADIO:
- NEWS:
- TOTAL SALES:

At the bottom of the modal are two buttons: "ADD" (orange) and "CLEAR" (blue).

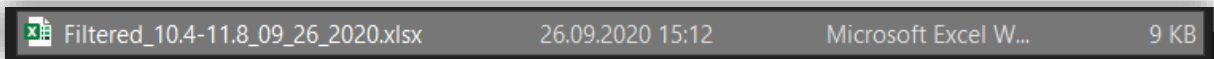
- If the user wants to export all or filtered data can use the “**Export to Excel**” and export displayed data to the excel file in the project file directory.

The application window shows filtered data for "TV Expense" (Between 10.4 and 11.8) and "Sales" (Between 10.4 and 11.8). The table below displays the filtered results:

	field1	TV	radio	newspaper	sales
0	2.0	44.5	39.3	45.1	10.4
1	7.0	57.5			1.8
2	10.0	199.8			0.6
3	19.0	69.7			1.3
4	30.0	70.0			0.5
5	47.0	89.7	9.9	35.7	10.6
6	51.0	199.8	3.1	34.6	11.4
7	52.0	100.4	9.6	3.6	10.7
8	74.0	129.4	5.7	31.3	11.0
9	80.0	116.0	7.7	23.1	11.0

A success message dialog box is displayed: "Advertising Sales Data has been exported!" with an "OK" button. The bottom right corner of the window shows "Count:93".

exports displayed data to the excel file in the project file directory.



- If the user wants to delete the filtered data (allows only the filtered data to be deleted, not all), you can use the "**Delete Advertising Data**" button and the application will once again prompt the user for the number of lines to be deleted.

Add New Record

Display Advertising Data

Export to Excel

Delete Advertising Data

	field1	TV	radio		
0	1.0	230.1	37.8		
1	2.0	44.5	39.3		
2	3.0	17.2	45.9		
3	4.0	151.5	41.3	58.5	18.5
4	5.0	180.8	10.8	58.4	12.9
5	6.0	8.7	48.9	75.0	7.2
6	7.0	57.5	32.8	23.5	11.8
7	8.0	120.2	19.6	11.6	13.2
8	9.0	8.6	2.1	1.0	4.8
9	10.0	199.8	2.6	21.2	10.6

Request?
×

?
Do you want to delete 63 record?

Yes
No

Count:63

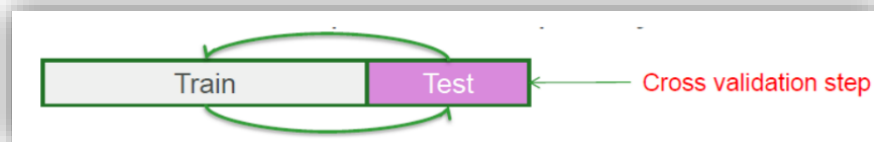
Advertising Data Statistical Detail				
	radio	newspap	Attributes	Coefficients
count	601.0	601.0	0 TV	-0.1163
mean	23.2881863560...	30.61830282	1 radio	1.0576
std	14.8215106136...	21.78122657	2 newspaper	0.0545
min	0.0	0.3		
25%	10.0	12.8		
50%	23.3	25.9		
75%	36.6	45.1		
max	49.6	114.0		

- “Advertising Data Statistical Detail” button displays the statistical properties of the attributes in the first table and contains the coefficients of attributes for the sales prediction of each of the targets.

- “**Calculate**” button, calculates the **MSE** and **RMSE** values with the **Cross Validation** parameter.

- **Cross Validation**

In cross-validation, the original sample is split into two parts. One part is called the training (or derivation) sample, and the other part is called the validation (or validation + testing) sample. Modeling of the data uses one part only. The model selected for this part is then used to predict the values in the other part of the data. A valid model should show good predictive accuracy.



- **MSE (Main Squared Error)**

The mean square error indicates how close a regression curve is to a set of points. The MSE measures the performance of a machine learning model, the predictor is always positive and it accepts that predictors with an MSE value close to zero perform better.


$$MSE = \frac{1}{n} \sum_{j=1}^n e_j^2$$

- **RMSE (Root Mean Square Error)**

The RMSE value is the standard deviation of the estimation errors. It is a measure of how far the regression line is from the data points; RMSE is a measure of how far these errors spread. A zero RMSE value means the model made no mistakes. RMSE has more advantage of punishing big mistakes.

$$RMSE = \sqrt{\frac{\sum_{j=1}^n e_j^2}{n}}$$

$$RMSE = \sqrt{MSE}$$


<b>Cross Validation</b> <input type="text" value="10"/>	 <b>Calculate</b>	<b>MSE</b>	<input type="text" value="2.971"/>
		<b>RMSE</b>	<input type="text" value="1.724"/>

- **“Predict”** button gives the sales prediction by using Linear Regression which is provided with the appropriate expenditure values to be entered by the user.

**TV Expense**

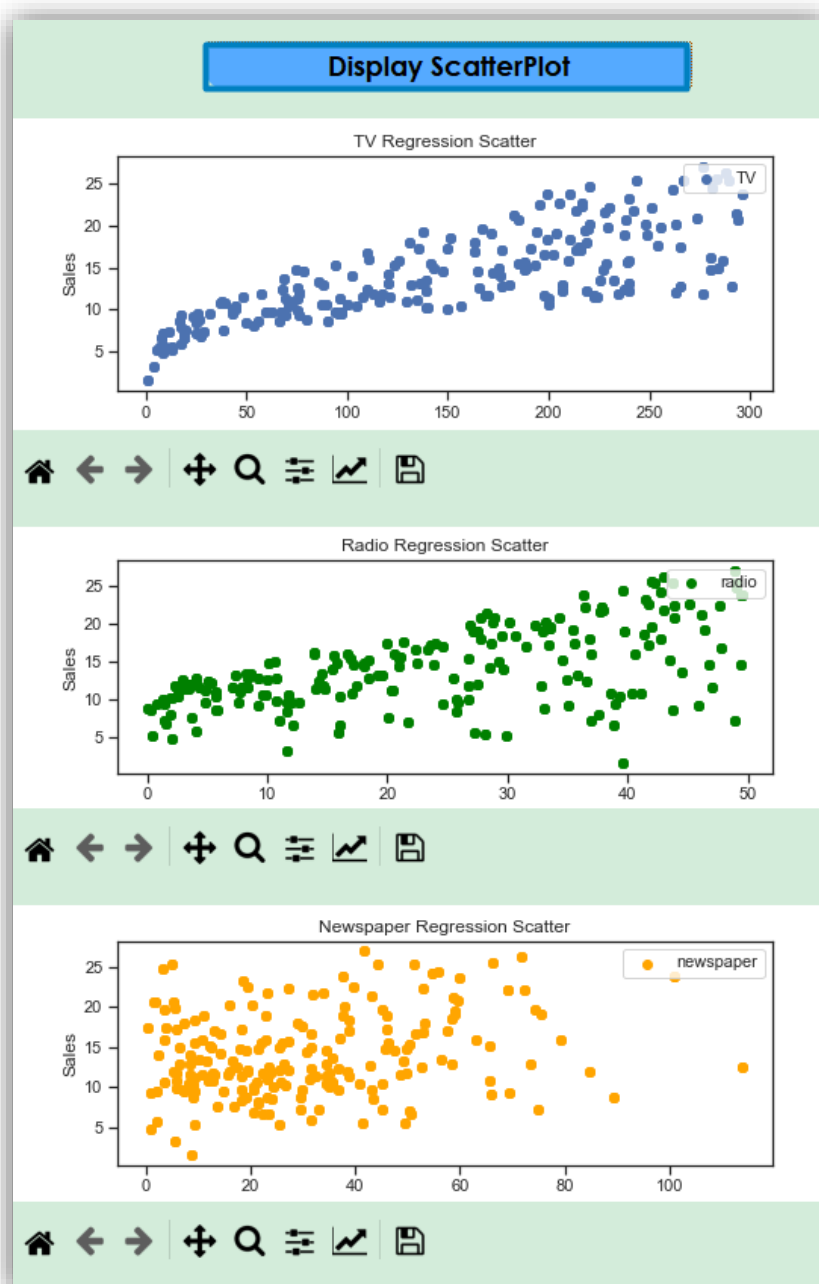
**Radio Expense**

**News Expense**


**Predict**

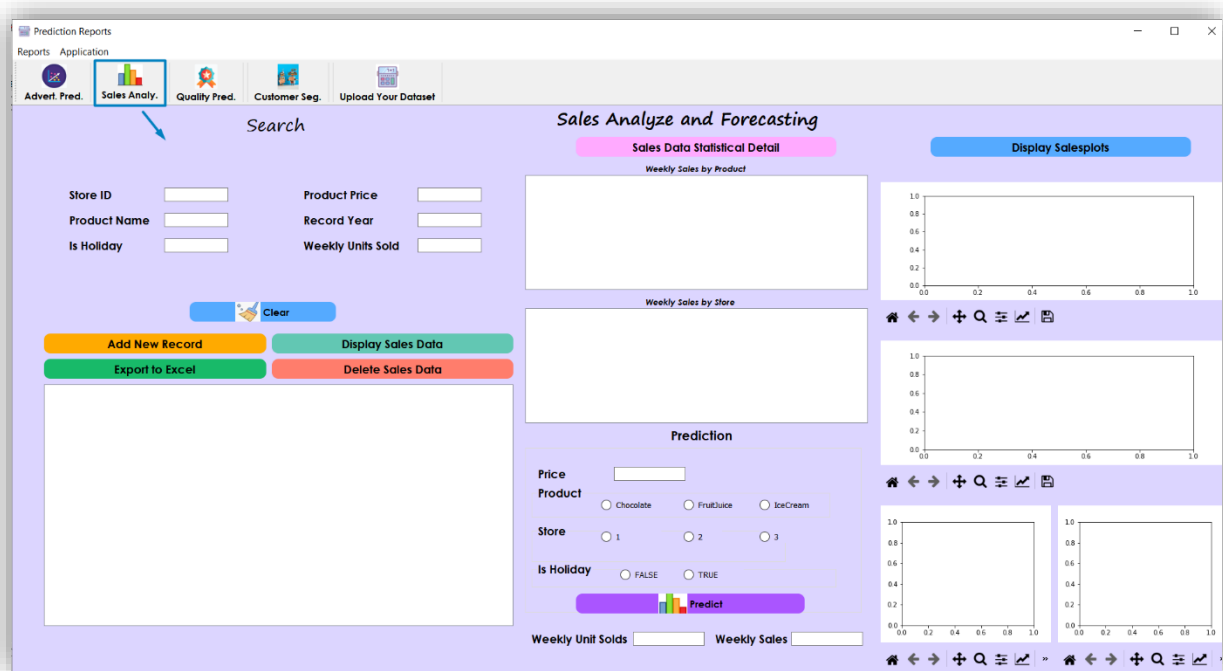
**Sales Forecast**

- **“Display ScatterPlot”** button displays the scatters of the advertising attributes (TV, Radio, News) to the sales data.



## 2) Sales Analyze and Forecasting

This page contains the product sales data of the Sales Department in the company.



- All sales data can display with the “Display Sales Data” button.

Add New Record							Display Sales Data						
Export to Excel							Delete Sales Data						
	Store	Product	Date	Is_Holiday	BasePrice								
0	1	IceCream	2017	FALSE	9.99	7.99							
1	1	IceCream	2017	TRUE	9.99	7.99							
2	1	IceCream	2017	FALSE	9.99	7.99							
3	1	IceCream	2017	FALSE	9.99	7.99							
4	1	IceCream	2017	FALSE	9.99	9.99							
5	1	IceCream	2017	FALSE	9.99	9.99							
6	1	IceCream	2017	FALSE	9.99	9.99							
7	1	IceCream	2017	FALSE	9.99	9.99							
8	1	IceCream	2017	FALSE	9.99	9.99							

Count:3861



- If the user wants to add a new record, can use the “Add New Record button” and fill the new sales record form in the incoming window.

The screenshot shows the main application interface on the left and a modal window titled "Add New Sales Record" on the right.

**Main Application Interface:**

- Buttons: "Add New Record" (orange), "Export to Excel" (green), and "Clear" (blue).
- Table:

	Store	Product	Date
0	1	IceCream	2017
1	1	IceCream	2017
2	1	IceCream	2017
3	1	IceCream	2017
4	1	IceCream	2017
5	1	IceCream	2017
6	1	IceCream	2017
7	1	IceCream	2017
8	1	IceCream	2017

**Add New Sales Record Modal:**

STORE

PRODUCT

DATE (YEAR)

IS HOLIDAY ☐ TRUE ☐ FALSE

BASE PRICE

PRICE

WEEKLY UNIT SOLD

Buttons: "ADD" (orange), "CLEAR" (blue)

- If the user wants to export all or filtered data can use the “Export to Excel” and export displayed data to the excel file in the project file directory.

The screenshot shows the application interface with the "Export to Excel" button highlighted. A success dialog box is displayed over the table.

**Form Fields:**

Store ID  Product Price

Product Name  Record Year

Is Holiday  Weekly Units Sold

Buttons: "Clear" (blue), "Add New Record" (orange), "Display Sales Data" (green), "Export to Excel" (green), "Delete Sales Data" (red).

**Table:**

	Store	Product	Date			
0	2	IceCream	2017			
1	2	IceCream	2017			
2	2	IceCream	2017			
3	2	IceCream	2017	FALSE	9.99	7.99
4	2	IceCream	2017	FALSE	9.99	9.99
5	2	IceCream	2017	FALSE	9.99	9.99
6	2	IceCream	2017	FALSE	9.99	9.99
7	2	IceCream	2017	FALSE	9.99	9.99
8	2	IceCream	2017	FALSE	9.99	9.99

**Success Dialog:**

Success!  
Sales Store Data has been exported!  
OK

**Count:1287**

- If the user wants to delete the filtered data (allows only the filtered data to be deleted, not all), you can use the "**Delete Sales Data**" button and the application will once again prompt the user for the number of lines to be deleted.

Store ID

Product Price

Product Name

Record Year

Is Holiday

Weekly Units Sold

Clear

Add New Record

Display Sales Data

Export to Excel

Delete Sales Data

Count:1287

Request?

Do you want to delete 1287 record?

Yes

No

- “**Sales Data Statistical Detail**” button displays the statistical properties of the Products in the first table and Stores in the second table according to the Weekly Unit Sold Totals.

Sales Data Statistical Detail				
Weekly Sales by Product				
	Chocolate	FruitJuice	IceCream	
count	1287.0	1287.0	1287.0	
mean	369.024087024...	135.861693861...	142.972027972...	
std	270.128576972...	215.519776386...	113.776119804...	
min	61.0	13.0	23.0	
Weekly Sales by Store				
	1	2	3	
count	1287.0	1287.0	1287.0	
mean	186.365967365...	220.447552447...	241.044289044...	
std	167.278538235...	227.568372324...	293.711335730...	
min	15.0	13.0	28.0	

- The Price, Product, Store and Is Holiday values to be entered by the user and the "**Prediction**" button gives the provided Weekly Unit Sales and Weekly Sales forecast by using ElasticNet Regression.

### Prediction

Price

Product

☒ Chocolate
 ☐ FruitJuice
 ☐ IceCream

Store

☐ 1
 ☒ 2
 ☐ 3

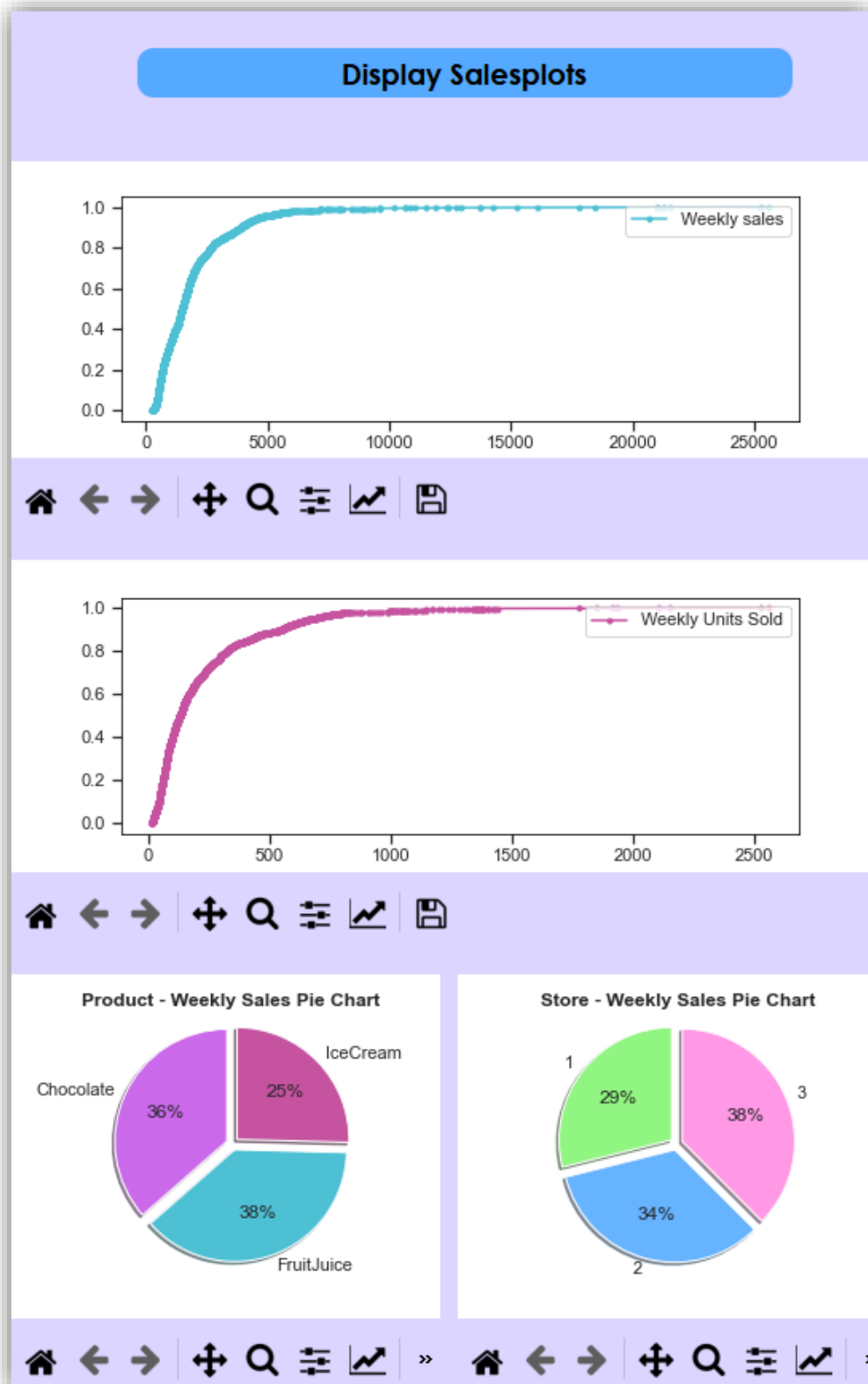
Is Holiday

☒ FALSE
 ☐ TRUE

Weekly Unit Solds

Weekly Sales

- “**Display Salesplots**” button displays the plot of weekly sales and weekly units sold quantities. It has been visualized by using ecdf (Empirical cumulative distribution function)  
The **ECDF** essentially allows you to plot a feature of your data in order from least to greatest and see the whole feature as if is distributed across the data set.
- Weekly sales are shown on pie charts by classifying by **product** and **store** percentages.



### 3) Wine Quality Segment Prediction

- This page contains the wine quality data of the R&D department in the company.

- All or filtered wine quality data can display with the “Display Wine Quality Data” button.

Add New Record						
Display Wine Quality Data						
Export to Excel						
Delete Wine Quality Data						
	fixedacidity	volatileacidity	citricacid	residualsugar	chlorides	free
0	7.1	0.27	0.36	20.7	0.045	45.0
1	6.3	0.3	0.34	1.6	0.049	14.0
2	8.1	0.28	0.4	6.9	0.05	30.0
3	7.2	0.23	0.32	8.5	0.058	47.0
4	7.2	0.23	0.32	8.5	0.058	47.0
5	8.1	0.28	0.4	6.9	0.05	30.0
6	6.2	0.32	0.16	7.1	0.045	30.0
7	7.1	0.27	0.36	20.7	0.045	45.0

Count:4900

- If the user wants to add a new record, can use the “**Add New Record button**” and fill the new wine quality record form in the incoming window.

Between  and   
chlorides

Between  and   
free sulfur dioxide

Between  and

**Add New Record**

**Export to Excel**

	fixedacidity	volatileacidity	citricacid
0	7.1	0.27	0.36
1	6.3	0.3	0.34
2	8.1	0.28	0.4
3	7.2	0.23	0.32
4	7.2	0.23	0.32
5	8.1	0.28	0.4
6	6.2	0.32	0.16
7	7.1	0.27	0.36

**Add New Wine Quality Record**

fixed acidity

volatile acidity

citric acid

residual sugar

chlorides

free sulfur dioxide

total sulfur dioxide

density

pH

sulphates

alcohol

quality

**ADD** **CLEAR**

- If the user wants to export all or filtered data can use the “**Export to Excel**” button and it exports displayed data to the excel file in the project file directory.

**Add New Record** **Display Wine Quality Data**

**Export to Excel** **Delete Wine Quality Data**

	fixedacidity	volatileacidity	citricacid
0	6.3	0.3	0.34
1	6.3	0.3	0.34
2	8.1	0.22	0.43
3	8.1	0.27	0.41
4	7.9	0.18	0.37
5	6.6	0.16	0.4
6	6.6	0.17	0.38
7	6.3	0.48	0.04

**Request?** Do you want to delete 1273 record?  
**Yes** **No**

**Count:1273**

- If the user wants to delete the filtered data (allows only the filtered data to be deleted, not all), you can use the "**Delete Wine Quality Data**" button and the application will once again prompt the user for the number of lines to be deleted.

The screenshot shows the application interface with various filter fields for wine quality data. A success message dialog is displayed over the table, indicating that the filtered data has been exported.

**Filters:**

- residual sugar:** Between 1.1 and 1.7
- chlorides:** Between [ ] and [ ]
- free sulfur dioxide:** Between [ ] and [ ]
- quality:** Between [ ] and [ ]
- alcohol:** Between [ ] and [ ]
- sulphates:** Between [ ] and [ ]

**Buttons:** Add New Record, Export to Excel

**Success! Dialog:** Wine residualsugar filtered Data has been exported! OK

	fixedacidity	volatileacidity	citricacid	residualsugar	chlorides	fre...
0	6.3	0.3	0.34	1.6	0.049	14.0
1	6.3	0.3	0.34	1.6	0.049	14.0
2	8.1	0.22	0.43	1.5	0.044	28.0
3	8.1	0.27	0.41	1.1	0.033	11.0
4	7.9	0.18	0.37	1.2	0.04	16.0
5	6.6	0.16	0.4	1.5	0.044	48.0
6	6.6	0.17	0.38	1.5	0.032	28.0
7	6.3	0.48	0.04	1.1	0.046	30.0

**Count:1273**

- "**Display Classification Rates**" button calculates the success rates of the supervised algorithms in the below list by using cross-validation parameter.

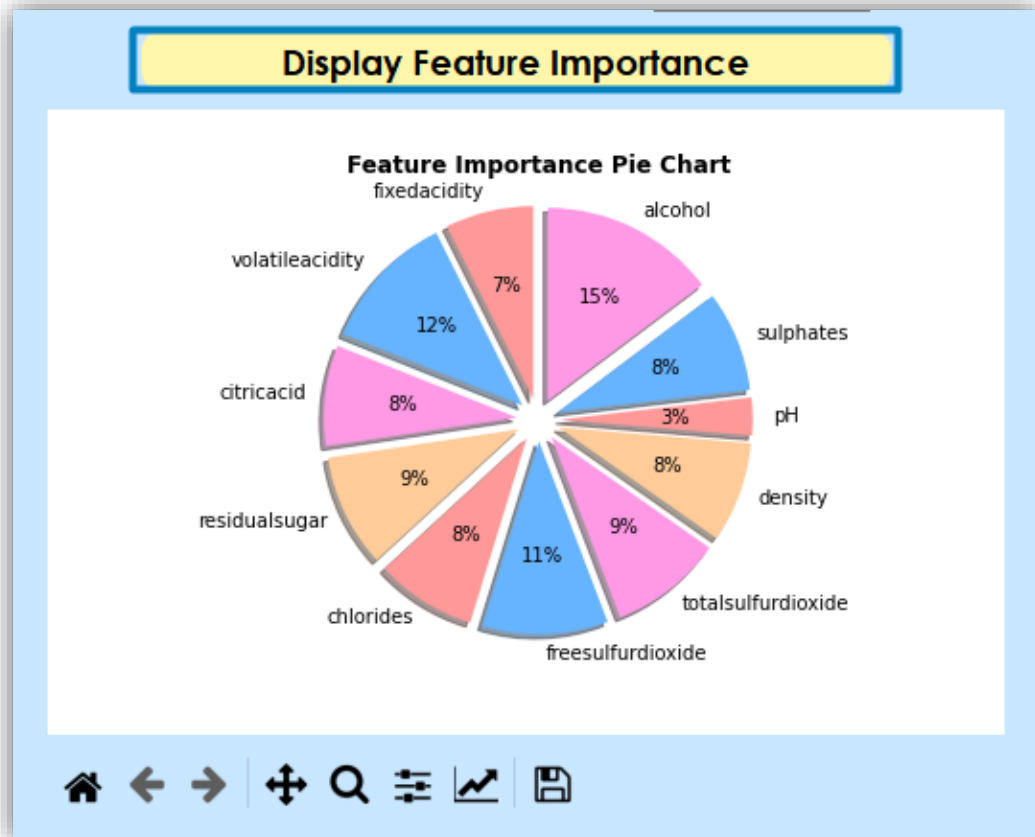
The screenshot shows the "Display Classification Rates" dialog with a cross-validation parameter set to 10. It lists the success rates for five supervised algorithms.

**Cross Validation:** 10

**Display Classification Rates**

- Decision Tree Classification (%)**  
Success Rate: 45.7
- Logistic Regression**  
Success Rate: 48.4
- KNeighbors Classification**  
Success Rate: 45.0
- Random Forest Classification**  
Success Rate: 61.3
- Linear Discriminant Analysis**  
Success Rate: 49.6

- **“Display Feature Importance”** button displays the Importance percentages of the features by using Random Forest Classification algorithm. Because maximum success rate provides through Random Forest Classification. Feature importance refers to a class of techniques for determining scores to input features to a predictive model that indicates the relative importance of each feature when making a prediction.





- “**Wine Quality Data Statistical Detail**” button displays the statistical outcomes of the **Alcohol** (Alcohol has %15 Importance) in the first table and **Volatileacidity** (Volatileacidity has %12 Importance) in the second table according to the Quality Score.

Wine Quality Data Statistical Detail				
Quality group by Alcohol				
	count	mean	std	min
3	20.0	10.3649999999...	1.23598458515...	8.0
4	163.0	10.1190184049...	1.18829435535...	1.9
5	1457.0	9.78938229238...	0.95098425157...	1.1
6	2200.0	10.5044000000...	1.20401732424...	1.1
Quality group by Volatileacidity				
	count	mean	std	min
3	20.0	0.33325000000...	0.14082720842...	0.17
4	163.0	6.54070552147...	78.6882926506...	0.11
5	1457.0	0.30201098146...	0.10006628237...	0.1
6	2200.0	0.30201098146...	0.10006628237...	0.1

- “**Predict**” button gives the Wine Quality Segment prediction by using Random Forest Classification which is provided with the experimental values to be entered by the user.

### Prediction

fixed acidity

volatile acidity

citric acid

residual sugar

chlorides

free sulfur dioxide

total sulfur dioxide

density

pH

sulphates

alcohol

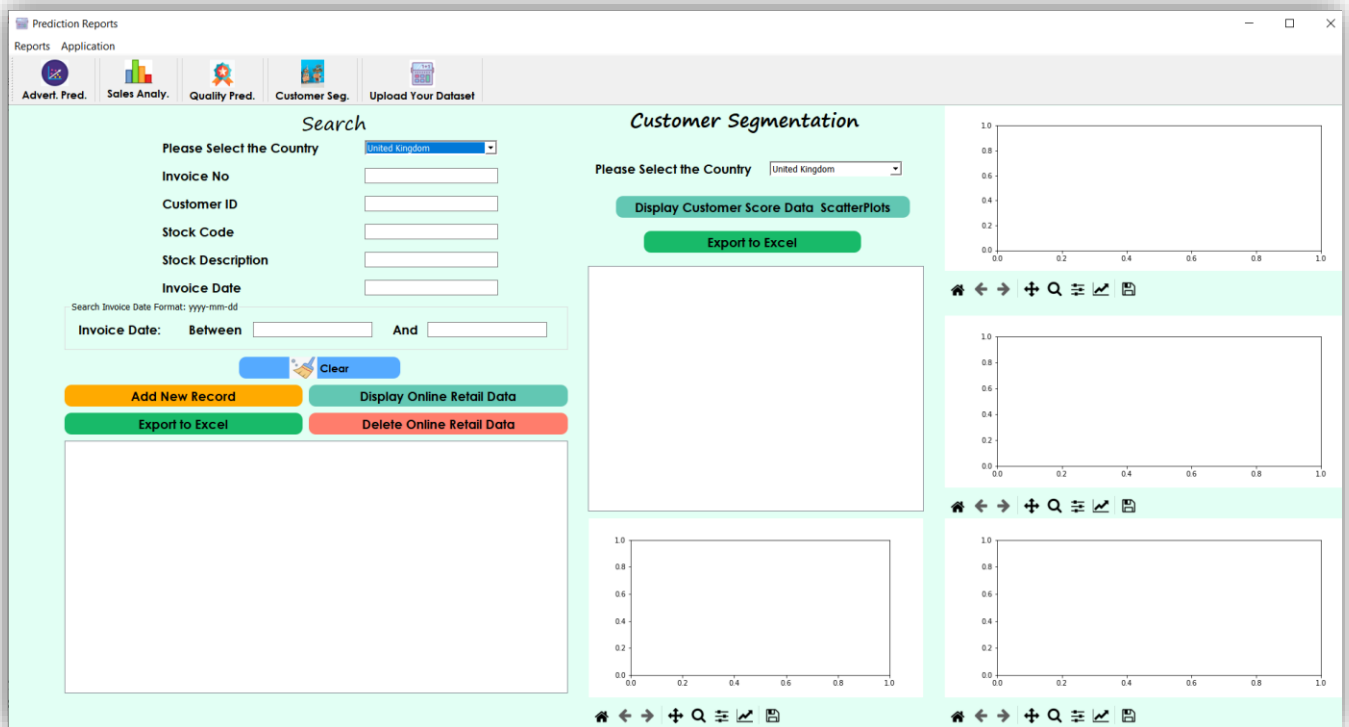
Predict

Clear

Wine Quality Segment

#### 4) Customer Segmentation

This page contains the online retail data of the Sales Department in the company and divided customers into the segments.

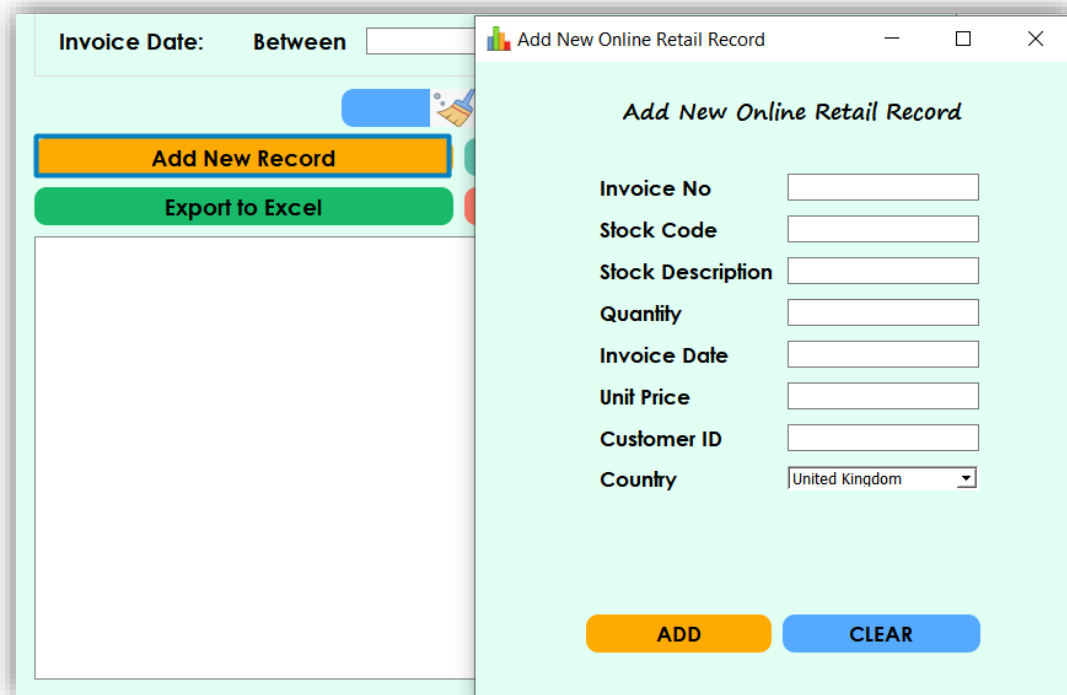


- All or filtered online retail data can display with the “Display Online Retail Data” button.

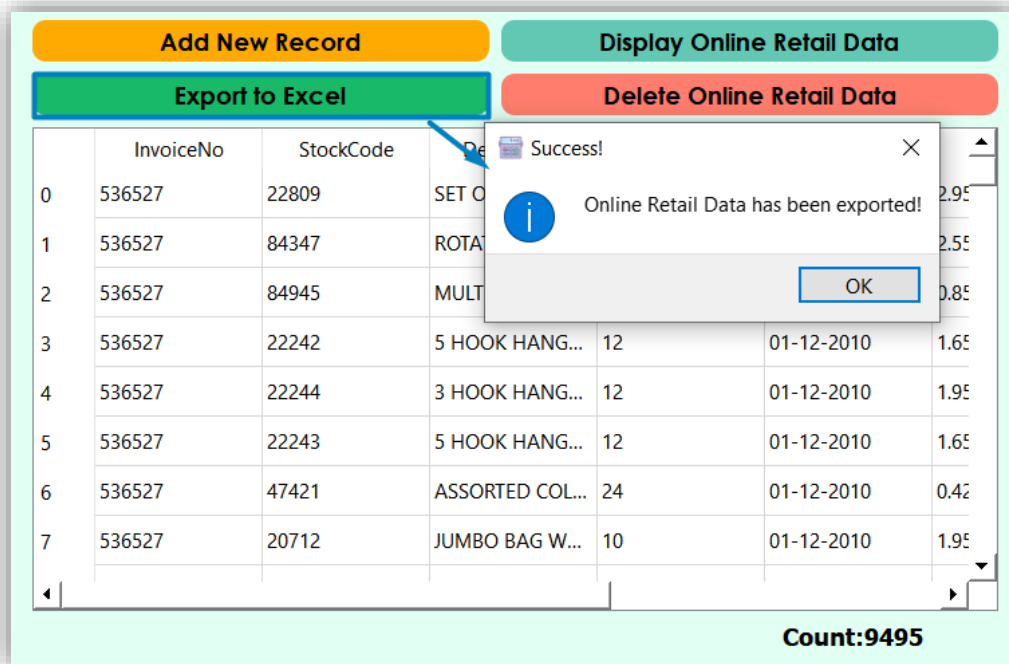
Add New Record						
Display Online Retail Data						
Export to Excel						
Delete Online Retail Data						
	InvoiceNo	StockCode	Description	Quantity	InvoiceDate	
0	536365	85123A	WHITE HANGIN...	6	01-12-2010	2
1	536365	71053	WHITE METAL L...	6	01-12-2010	3
2	536365	84406B	CREAM CUPID ...	8	01-12-2010	2
3	536365	84029G	KNITTED UNIO...	6	01-12-2010	3
4	536365	84029E	RED WOOLLY H...	6	01-12-2010	3
5	536365	22752	SET 7 BABUSHK...	2	01-12-2010	7
6	536365	21730	GLASS STAR FR...	6	01-12-2010	4
7	536366	22633	HAND WARME...	6	01-12-2010	1

Count:495478

- If the user wants to add a new record, can use the “**Add New Record button**” and fill the new online retail record form in the incoming window.



- If the user wants to export all or filtered data can use the “**Export to Excel**” button the new online retail record form in the incoming window. and it exports displayed online retail data to the excel file in the project file directory.



	InvoiceNo	StockCode	Description	Quantity	Invoice Date	Price
0	536527	22809	SET O			2.95
1	536527	84347	ROTA			2.55
2	536527	84945	MULT			0.85
3	536527	22242	5 HOOK HANG...	12	01-12-2010	1.65
4	536527	22244	3 HOOK HANG...	12	01-12-2010	1.95
5	536527	22243	5 HOOK HANG...	12	01-12-2010	1.65
6	536527	47421	ASSORTED COL...	24	01-12-2010	0.42
7	536527	20712	JUMBO BAG W...	10	01-12-2010	1.95

**Count:9495**

- If the user wants to delete the filtered data (allows only the filtered data to be deleted, not all), you can use the "**Delete Online Retail Data**" button and the application will once again prompt the user for the number of lines to be deleted.

Stock Code

22809

Stock Description

Invoice Date

Search Invoice Date Format: yyyy-mm-dd

Invoice Date:

Between

And

Clear

Add New Record

Display Online Retail Data

Export to Excel

Delete Online Retail Data

	InvoiceNo	StockCode	Description	Quantity	InvoiceDate	UnitPri
0	536527	22809	SET OF 6 T-LIG...	6	01-12-2010	2.95

Request?

Do you want to delete 1 record?

Yes

No

Count:1

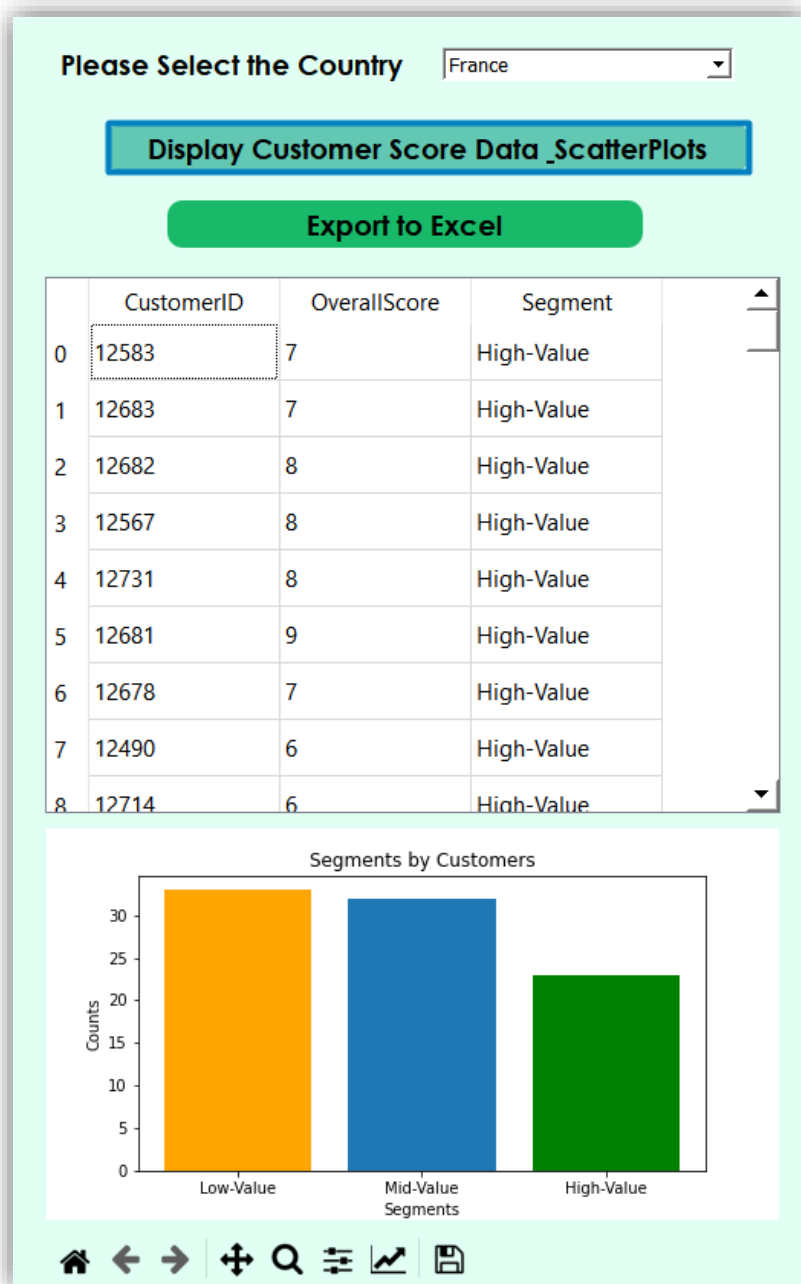
- “**Display Customer Score Data\_ScatterPlots**” button segments customers according to their **recency**, **frequency** and **revenue** values.

The recency value will be calculated based on the most recent purchase date of each customer, Depends on how many days have passed since your last purchase. Unsupervised K-means clustering algorithm will be used to get the recency score of customers.

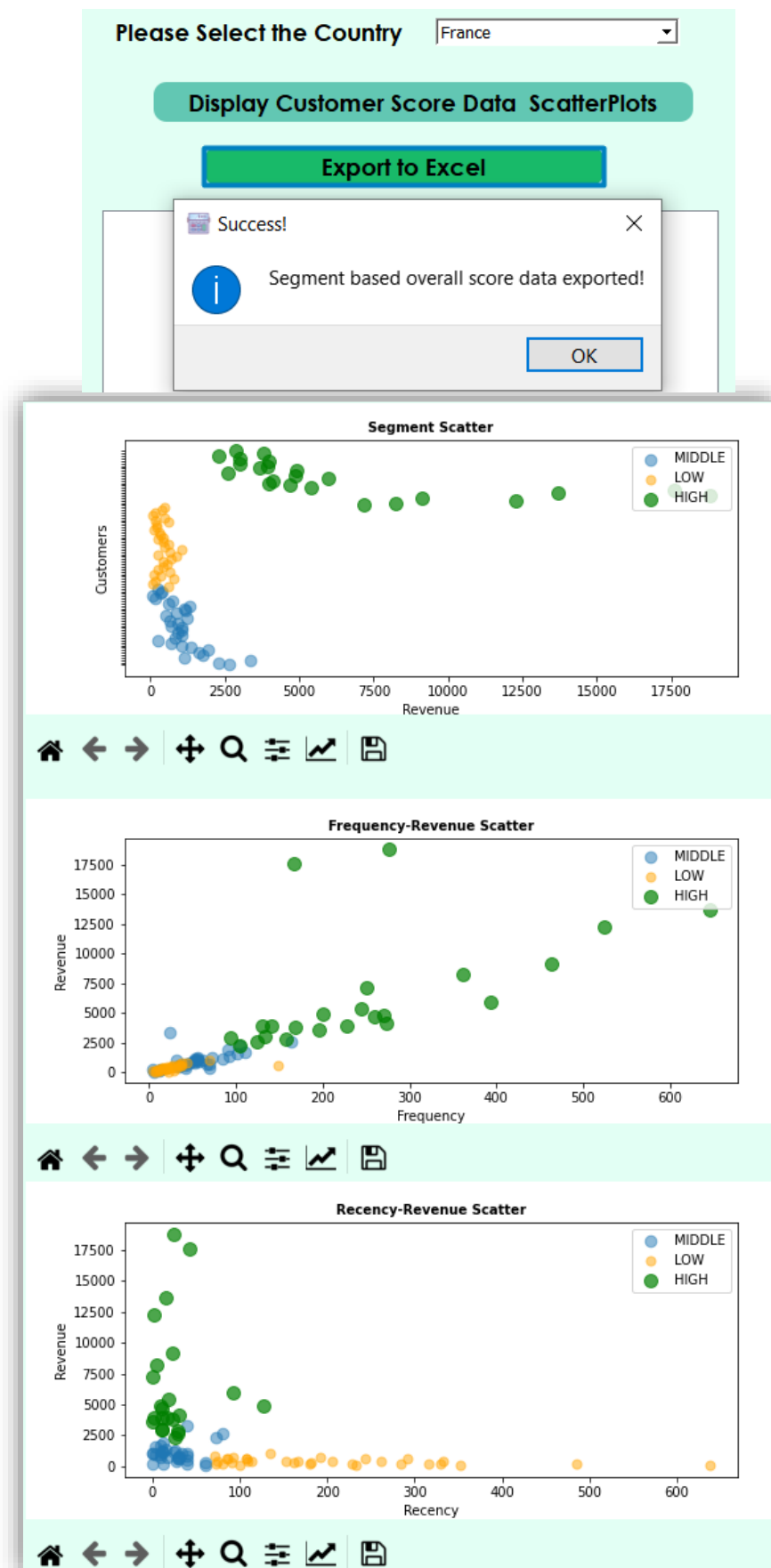
The frequency value is based on how many orders have been taken from customers and order total numbers for each customer.

The revenue value is calculated by multiplying Unit Price and Quantity for each order.

The overall score will be calculated with the average values of Recency, frequency, revenue values for each customer by using unsupervised **Kmeans** algorithm. Hereby, customers will be separated by the segments based on the overall score. Between 0 and 2 will be **Low Value**, between 3 and 4 will be **Mid Value**, greater than 5 will be **High Value**.

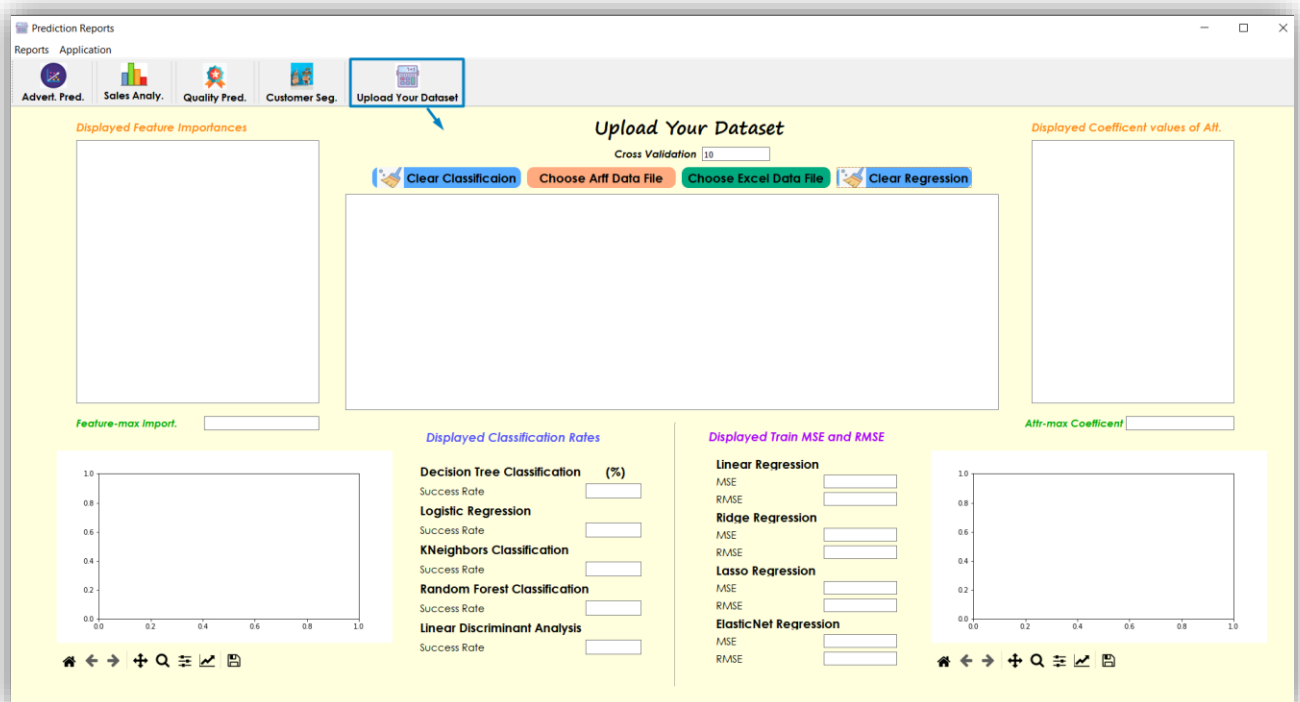


If the user wants to export customer score data can use the “**Export to Excel**” and export displayed data to the excel file in the project file directory. “**Display Customer Score Data\_ScatterPlots**” displays scatter plots by visualizing the relational relationships between frequency, revenue and recency values.

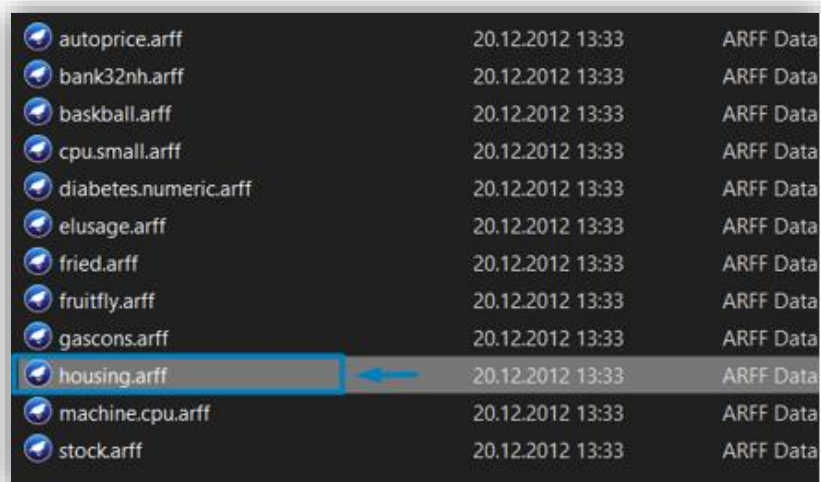


## 5) Upload Your Dataset

- This page evaluates whether the data to be loaded by the user is regression or classification. The evaluation function has been tested with over 300 data sets.



- “Choose Arff Data File” button allows to find in file explorer the arff data file to be uploded by the user and evaluates the uploded data as regression or classification.



- After selecting the arff data file, the application will evaluate the loaded data and share information on whether it is a regression or a classification.

Cross Validation

Clear Classification
Choose Arff Data File
Choose Excel Data File
Clear Regression

	CRIM	ZN	INDUS	CHAS	NOX	RM	AGE	
0	0.00632	18.0	2.31	0	0.538	6.575	65.2	4.09
1	0.02731	0.0	7.07	0	0.469	6.421	78.9	4.967
2	0.02729	0.0	7.07	0	0.469	7.185	61.1	4.967
3	0.03237	0.0	2.18	0	0.458	6.998	45.8	6.062
4	0.06905	0.0	2.18	0	0.458	7.147	54.2	6.062
5	0.02985	0.0	2.18	0	0.458	6.43	58.7	6.062
6	0.08829	12.5	7.87	0	0.524	6.012	66.6	5.560

Info

Your dataset is Regression!

OK

- After pressing the OK button; displayed Coefficient value of Attributes, Displayed Train **MSE** and **RMSE** fields will be filled with the calculated values. Regression ScatterPlot will be visualized by denoting **max\_coefficient** on the horizontal axis and **last column** as variable on vertical the horizontal axis.

### Upload Your Dataset

Cross Validation

Clear Classification
Choose Arff Data File
Choose Excel Data File
Clear Regression

	CRIM	ZN	INDUS	CHAS	NOX	RM	AGE	
0	0.00632	18.0	2.31	0	0.538	6.575	65.2	4.09
1	0.02731	0.0	7.07	0	0.469	6.421	78.9	4.967
2	0.02729	0.0	7.07	0	0.469	7.185	61.1	4.967
3	0.03237	0.0	2.18	0	0.458	6.998	45.8	6.062
4	0.06905	0.0	2.18	0	0.458	7.147	54.2	6.062
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6	0.08829	12.5	7.87	0	0.524	6.012	66.6	5.560

#### Displayed Coefficient values of Att.

Attributes	Coefficients
0 CRIM	-0.1131
1 ZN	0.0301
2 INDUS	0.0404
3 CHAS	2.7844
4 NOX	-17.2026
5 RM	4.4388
6 AGE	-0.0063
7 DIS	-1.4479
8 RAD	0.2624
9 TAX	-0.0106

Atr-max Coefficient

#### Displayed Classification Rates

**Decision Tree Classification (%)**  
Success Rate

**Logistic Regression**  
Success Rate

**KNeighbors Classification**  
Success Rate

**Random Forest Classification**  
Success Rate

**Linear Discriminant Analysis**  
Success Rate

#### Displayed Train MSE and RMSE

**Linear Regression**  
MSE   
RMSE

**Ridge Regression**  
MSE   
RMSE

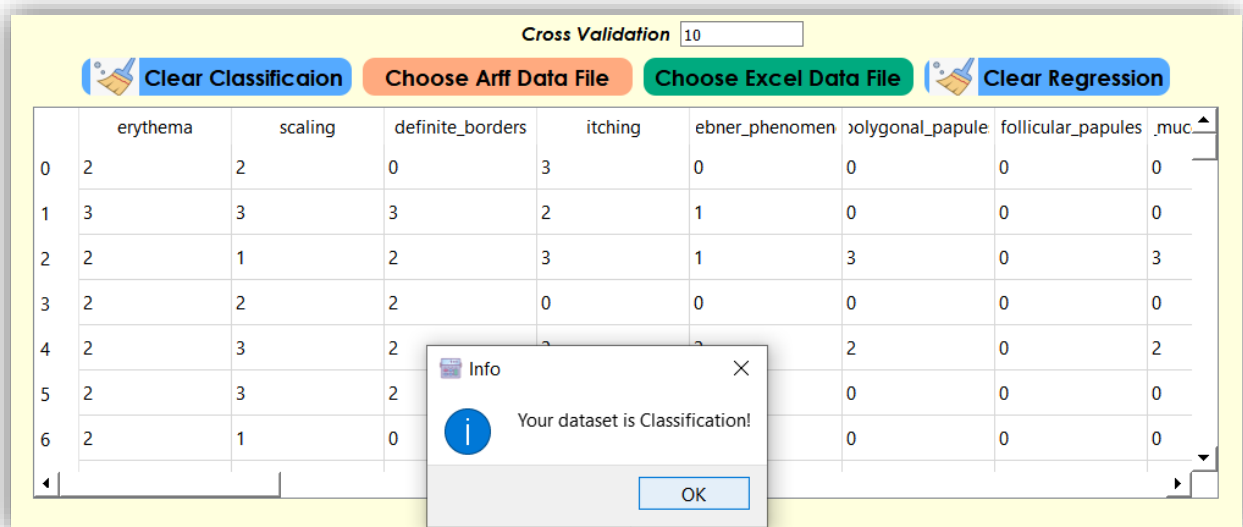
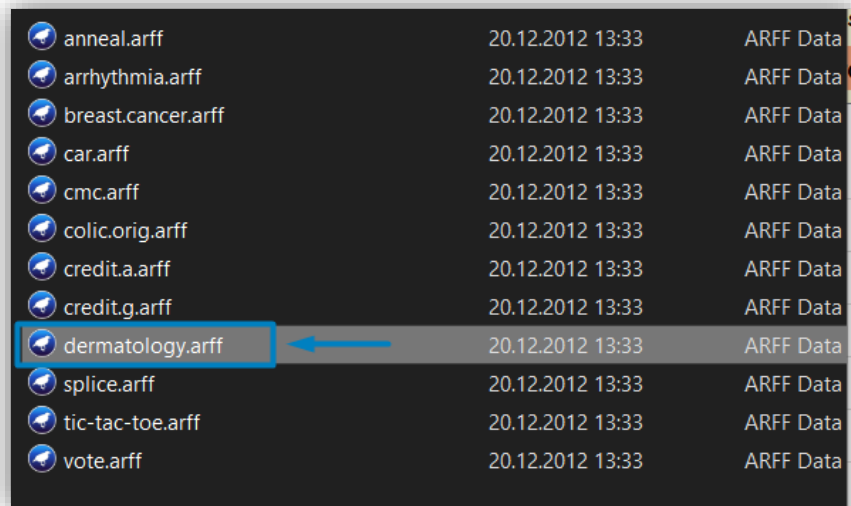
**Lasso Regression**  
MSE   
RMSE

**ElasticNet Regression**  
MSE   
RMSE

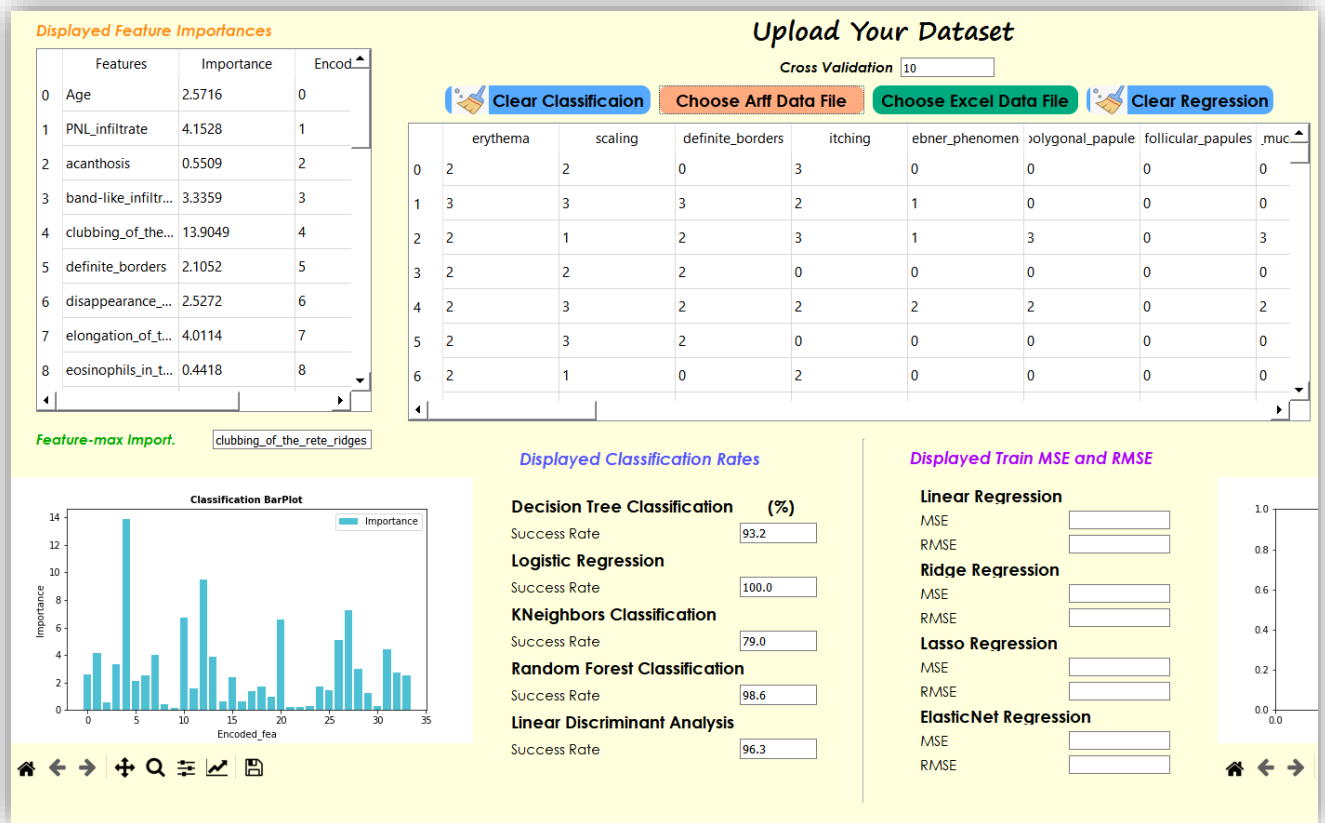
#### Regression ScatterPlot



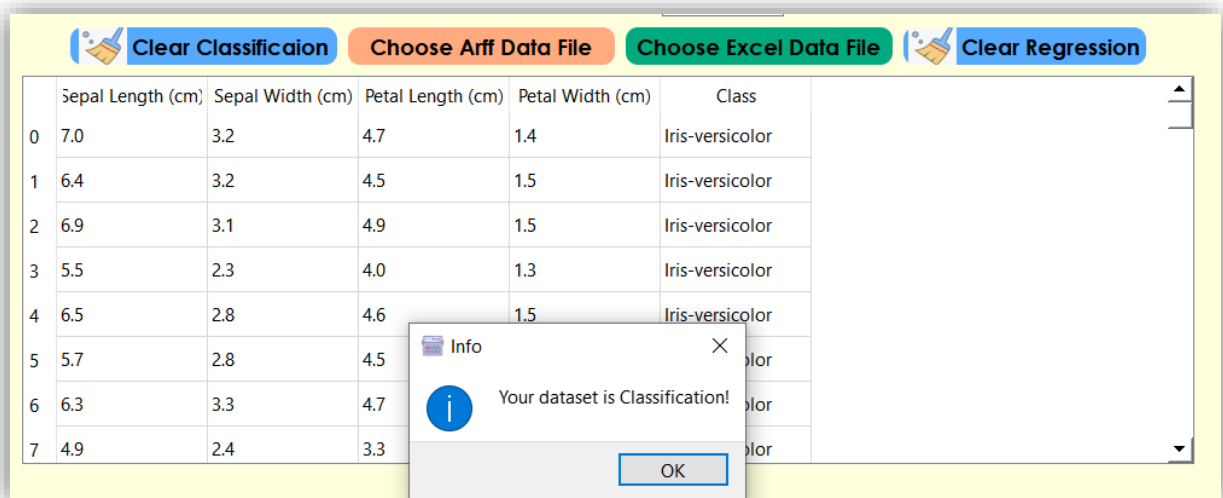
- When the user select an other arff data file by pressing “Choose Arff Data File”, application will evaluate the data file once again.



- If the data determined as Classification, , **Displayed Feature Importance**, **Displayed Classification Rates** fields will be filled with the calculated supervised algorithms success rates.
- Classification Bar Plot will be visualized by denoting encoded feature on the horizontal axis and Importance percentage on the vertical axis.



- “Choose Excel Data File” button allows to find in file explorer the .xls or .xlsx data file to be uploaded by the user and evaluates the uploaded data as regression or classification.

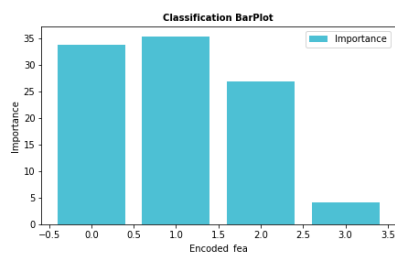


### Displayed Feature Importances

	Features	Importance	Encoded_f
0	Petal Length (cm)	33.7033	0
1	Petal Width (cm)	35.3616	1
2	Sepal Length (cm)	26.8156	2
3	Sepal Width (cm)	4.1195	3

Feature-max Import.

Petal Width (cm)



### Upload Your Dataset

Cross Validation

10



Clear Classification

Choose Arff Data File

Choose Excel Data File



Clear Regression

	Sepal Length (cm)	Sepal Width (cm)	Petal Length (cm)	Petal Width (cm)	Class
0	7.0	3.2	4.7	1.4	Iris-versicolor
1	6.4	3.2	4.5	1.5	Iris-versicolor
2	6.9	3.1	4.9	1.5	Iris-versicolor
3	5.5	2.3	4.0	1.3	Iris-versicolor
4	6.5	2.8	4.6	1.5	Iris-versicolor
5	5.7	2.8	4.5	1.3	Iris-versicolor
6	6.3	3.3	4.7	1.6	Iris-versicolor
7	4.9	2.4	3.3	1.0	Iris-versicolor

### Displayed Classification Rates

#### Decision Tree Classification (%)

Success Rate

#### Logistic Regression

Success Rate

#### KNeighbors Classification

Success Rate

#### Random Forest Classification

Success Rate

#### Linear Discriminant Analysis

Success Rate

### Displayed Train MSE and RMSE

#### Linear Regression

MSE

RMSE

#### Ridge Regression

MSE

RMSE

#### Lasso Regression

MSE

RMSE

#### ElasticNet Regression

MSE

RMSE

