Machine Learning Documentation:

1. Numerical Dataset:

2.1) General Information about the dataset:

Name of the used Dataset: House Pricing

Name of Target : price

Toal Number of used Samples: 4600

Number of samples after removing outliers: 4253

Number of samples used in training/validation: 3402

Number of samples used in testing: 851

2.2) Implementation details:

a. At feature extraction phase:

The features were extracted is: 12

The name of features: (bedrooms, sqft_living, sqft_lot,floors,view,condition,sqft_above,sqft_basement,yr_built, yr_renovated,city,country)

b. cross validation is used

Numbers of Folds: 10

Ratio of training / validation : 9/1

c. Hyperparmeters used in knn regressor:

n_neighbors=k

weights = 'distance'

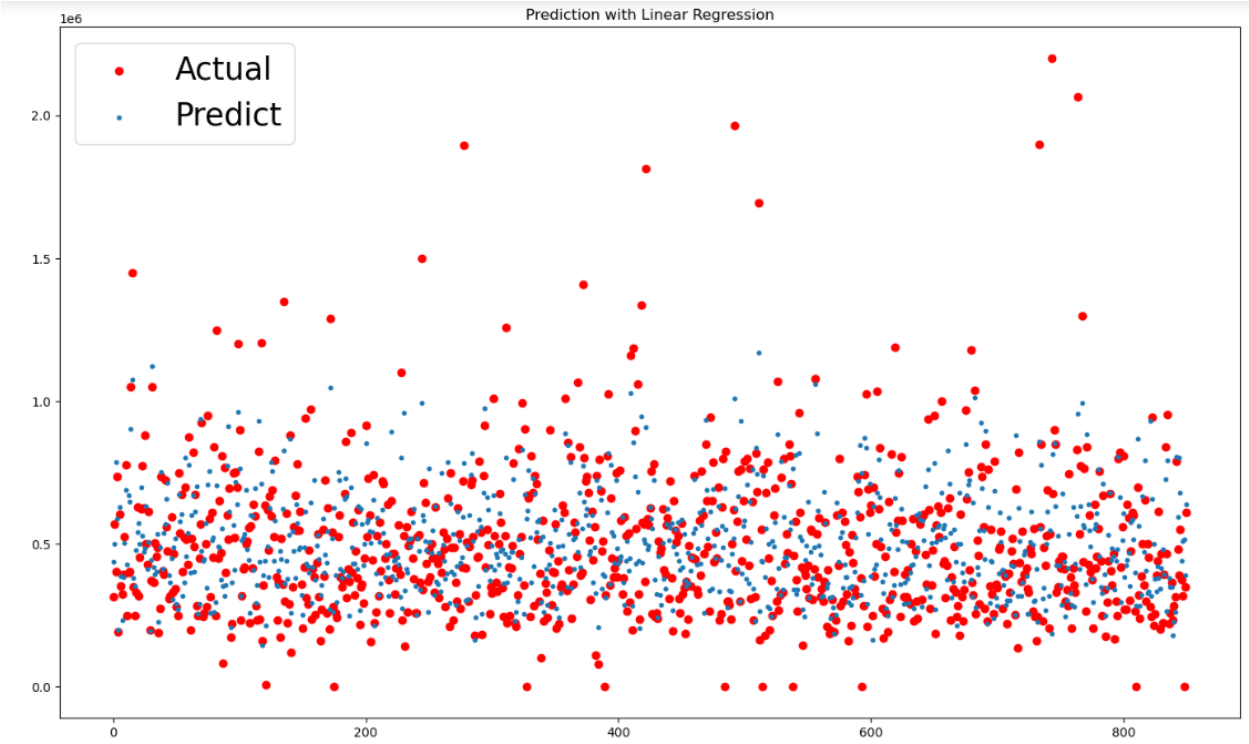
These hyperparameters influence the model's performance and should be tuned based on the characteristics of the data.

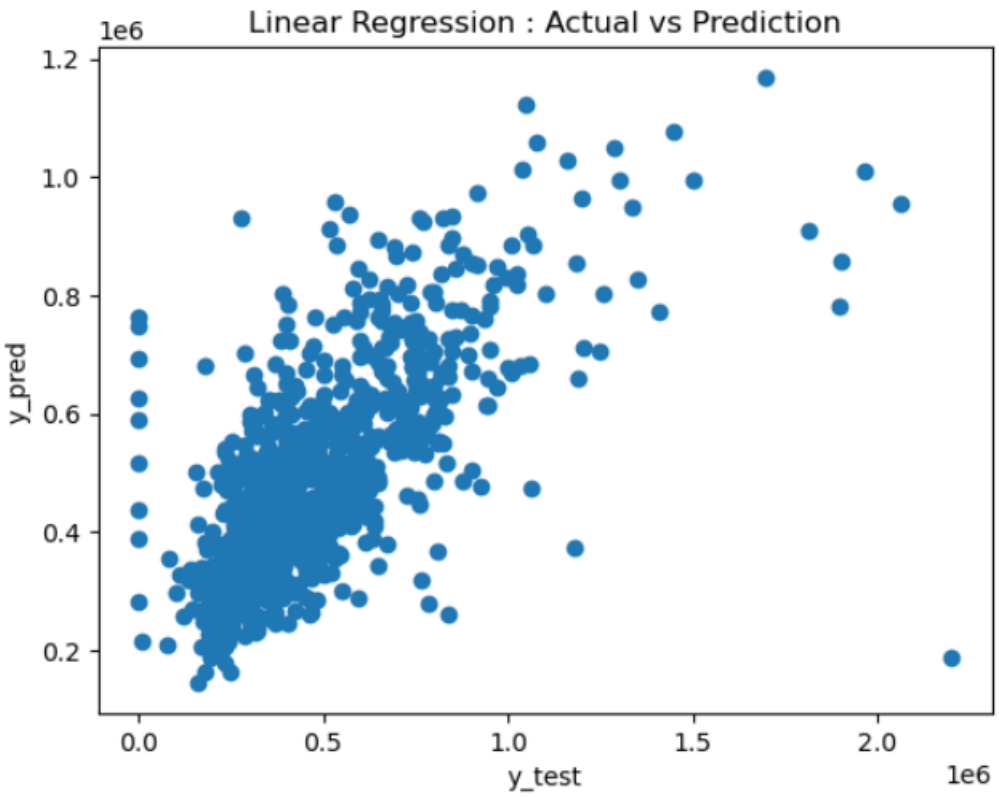
2.3) Results Details:

Linear Regression:

The RMSE value is 39366602465.76078

The R square value is 0.44738168058928346

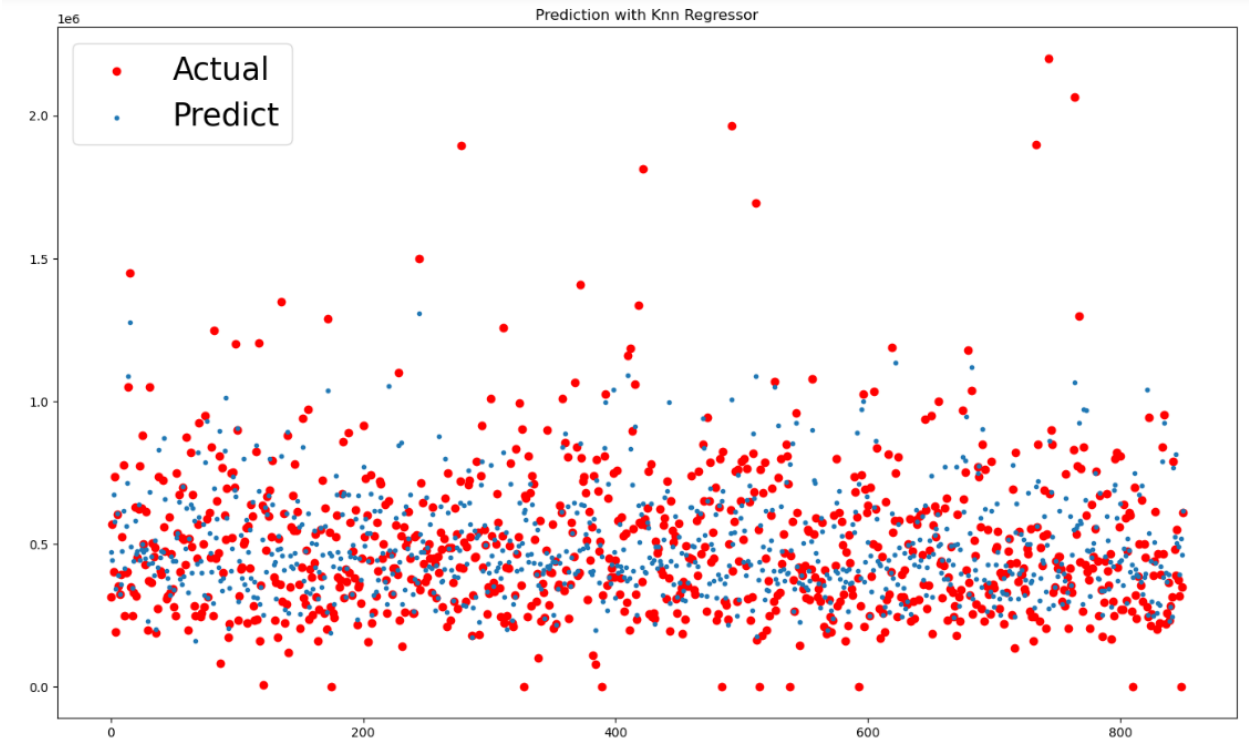


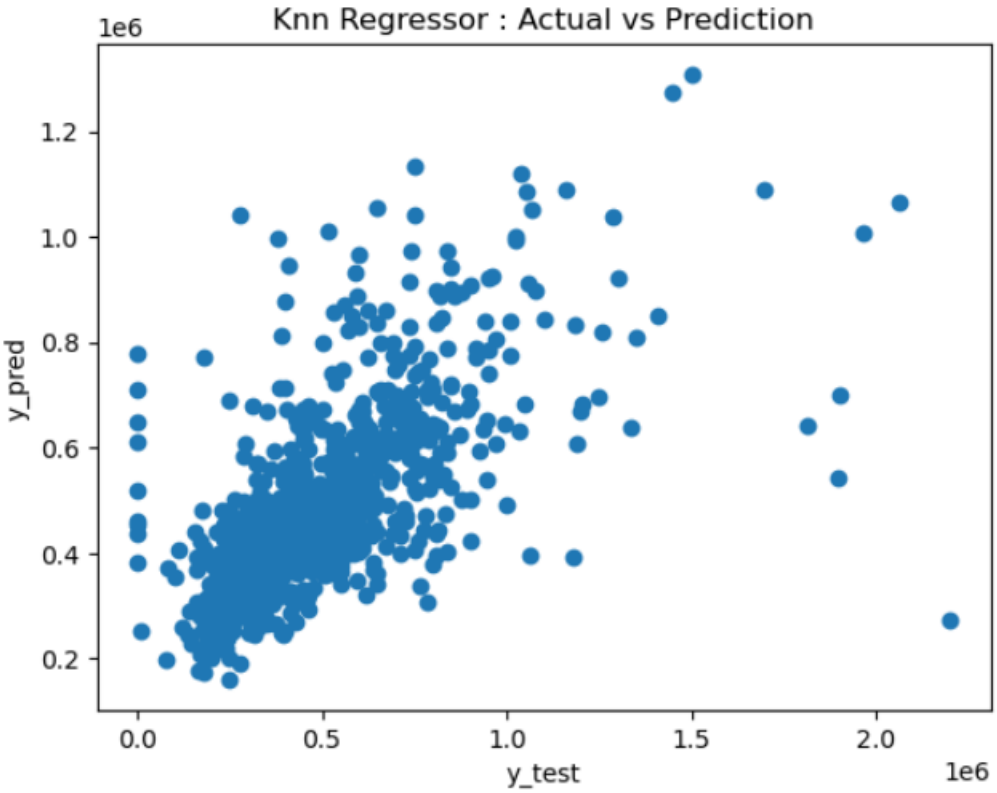


Knn Regressor:

The RMSE value is 40205880582.642654

The R square value is 0.4379306581817678


Prediction with Knn Regressor
1e6
Actual
Predict
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800


Knn Regressor : Actual vs Prediction
1e6
y_pred
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.5
1.0
1.5
2.0
y_test
1e6

2. Image Dataset:

2.1) General Information about the dataset:

Name of the used Dataset: PlantVillage Dataset

Number of used classes: 3

Their Labels:

1. Pepper__bell___Bacterial_spot
2. Potato___Early_blight
3. Potato___Late_blight

Toal Number of used Samples: 2997

Images Dimensions: 256*256

Averages size of Images: .2MB

Number of training samples: 2397

Number of testing samples: 600

2.2) Implementation details:

Average number of Features: 366

Average dimension Features: 128.0

Hyperameters used in Logistic Regression:

multi_class='multinomial'

Means multiple classes not binary as default

solver='lbfgs'

They are optimization algorithms used to find the weights that minimize the loss function and the choice dependes on the size of a dataset and the type of regulralization

max_iter=2000

In the fitting step this is the number of iterations to reach to convergence (control the convergence) or most smallest loss function which is zero

Hypermeters used in K-means:

n_clusters= 3

Represents the number of centroids (clusters) that the kmeans will produce

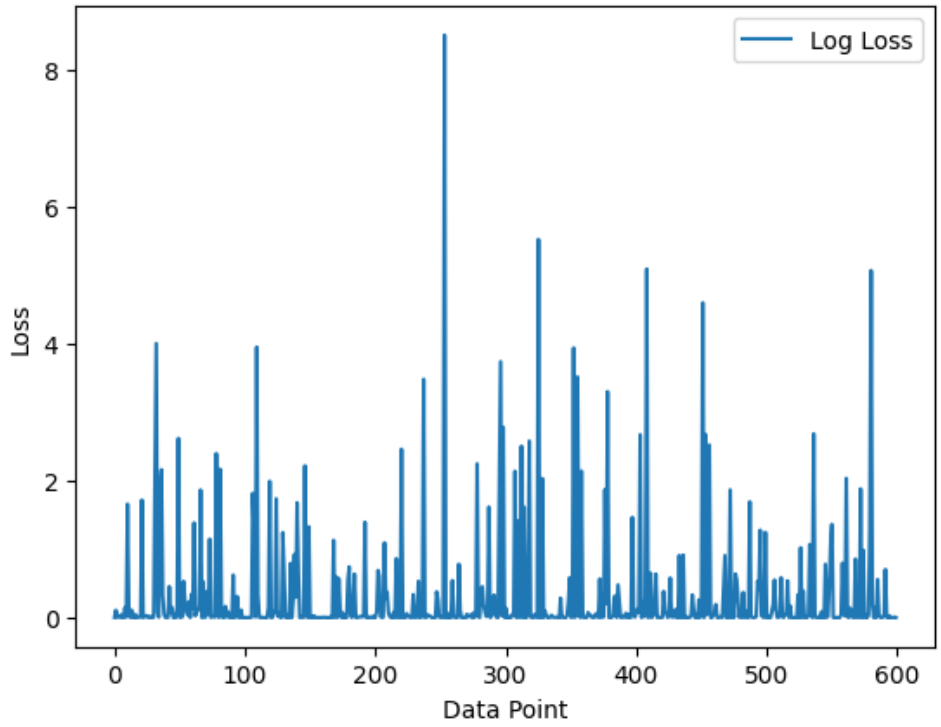
max_iter=1000

Sets the number of maximum iterations for each initialization of the k-means algorithm

2.3)Results Details:

Logistic Regression:

loss curve

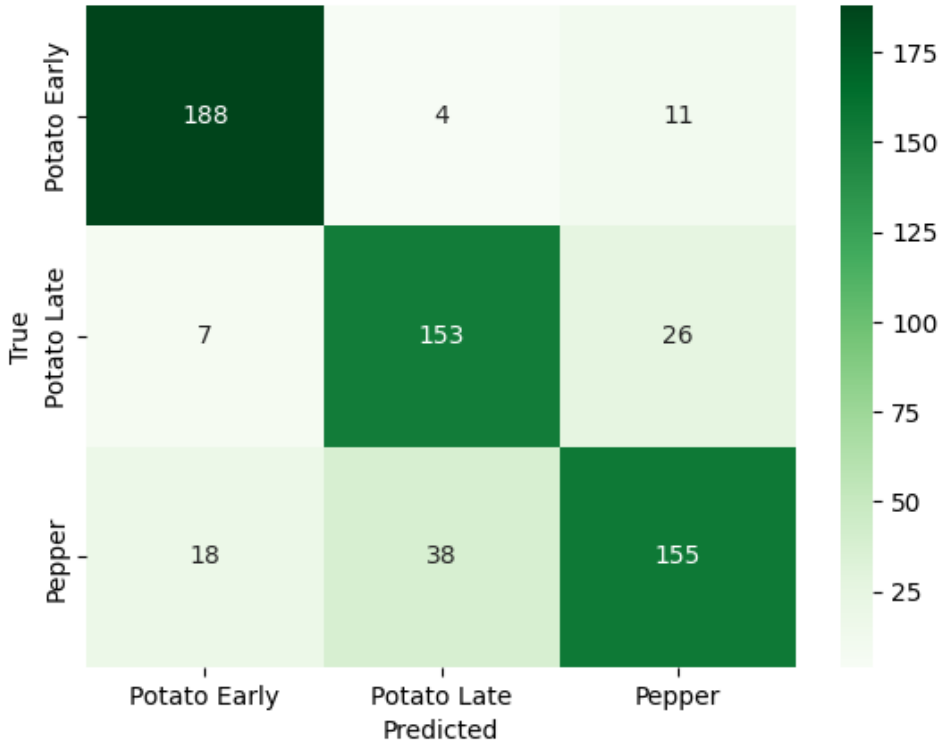


accuracey: 83%

Confusion Matrix:

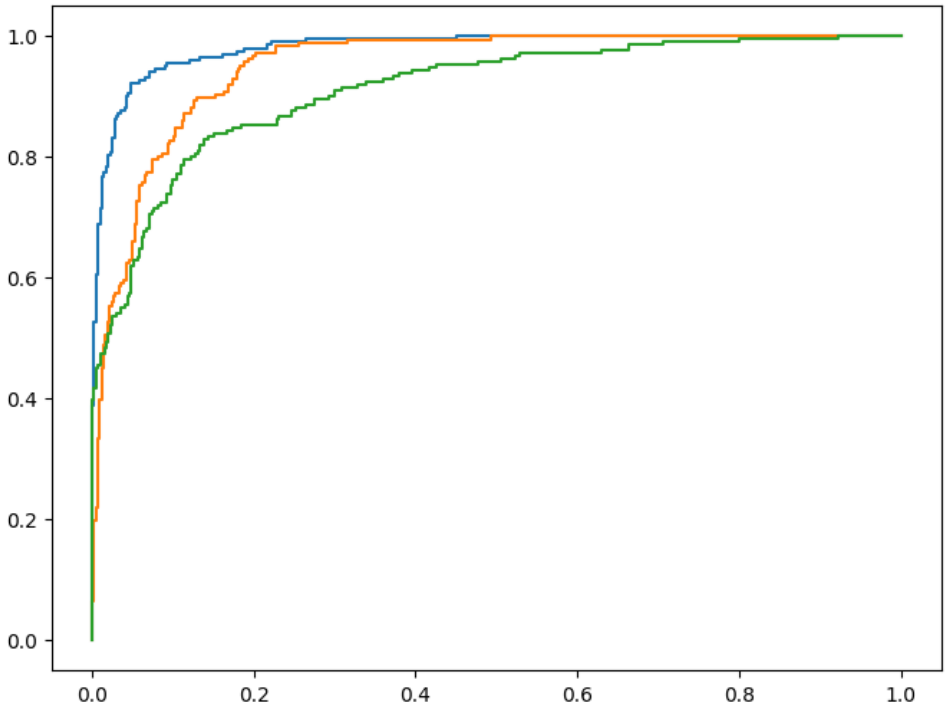
Rows represent the actual classes.

Columns represent the predicted classes



ROC Curve:

representation of the performance of a binary classification model across different thresholds. It helps you to understand the trade-off between the true positive rate (sensitivity) and the false positive rate (1 - specificity) at various classification thresholds



K-Means:

Accuracy: 43%

Note: kmeans doesn't have confusion matrix, roc curve, or loss curve; because it's unsupervised. Getting those would require mapping the cluster labels to actual labels.