https://github.com/EdouardDabo/DIA

Telco Customer churn dataset

Code explanation:

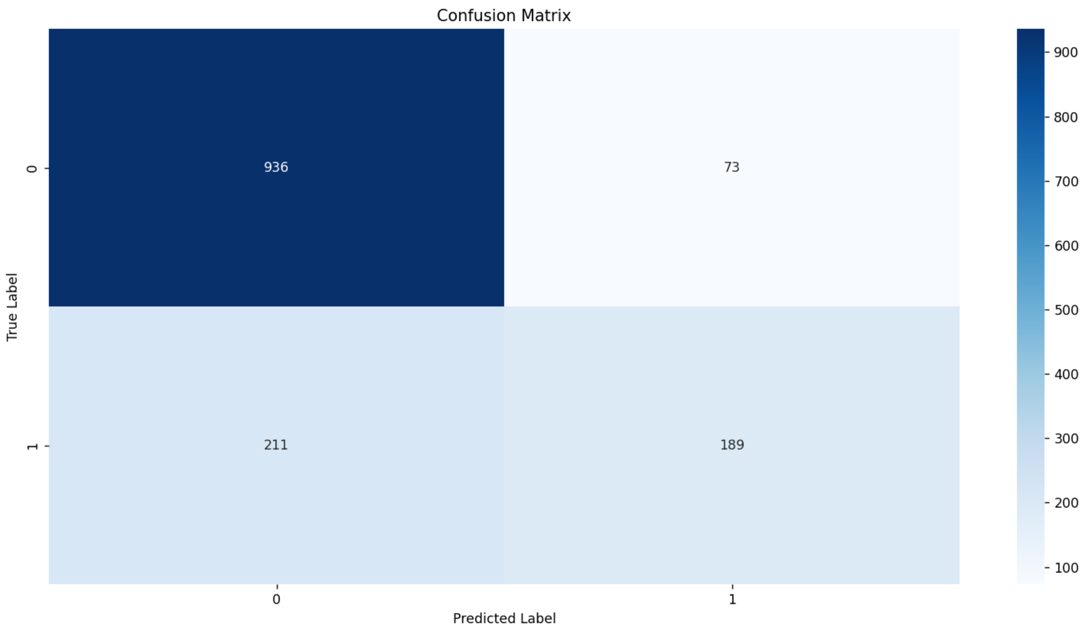
This code is an implementation of a Random Forest Classifier model to predict customer churn in a Telco company. We use the pandas library to load the dataset from an CSV file and preprocess it. The train_test_split function from sklearn.model_selection is used to split the dataset into training and testing sets. The RandomForestClassifier class from sklearn.ensemble is used to initialize the model with 100 estimators. The model is then trained on the training set using the fit method. The predict method is used to make predictions on the testing set. Finally, the accuracy_score, confusion_matrix, and classification_report functions from sklearn.metrics are used to evaluate the model's performance. The confusion matrix is plotted using the heatmap function from seaborn and matplotlib libraries.

The dataset used contains information about customers who left within the last month. The dataset has 21 columns and 7,043 rows. The target variable is the Churn Label column, which indicates whether a customer has left or not. The features used in the model are all columns except for Churn Label, Churn Value, Churn Score, CLTV, and Churn Reason. The categorical variables in the dataset are converted to dummy/indicator variables using the get_dummies function from pandas.

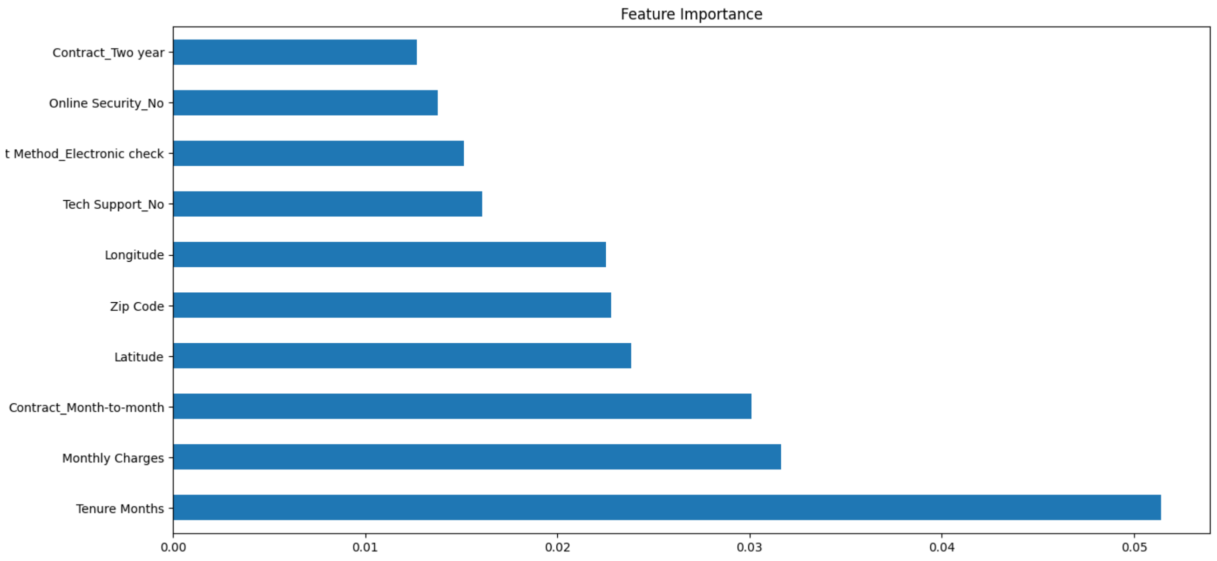
The model's accuracy is 0.7877, or 79%. The confusion matrix shows the number of true positives, false positives, true negatives, and false negatives. The classification report shows the precision, recall, f1-score, and support for each class. The heatmap shows the confusion matrix in a graphical format.

The model's performance was improved by adding two more components to the code: feature importance plot and ROC curve.

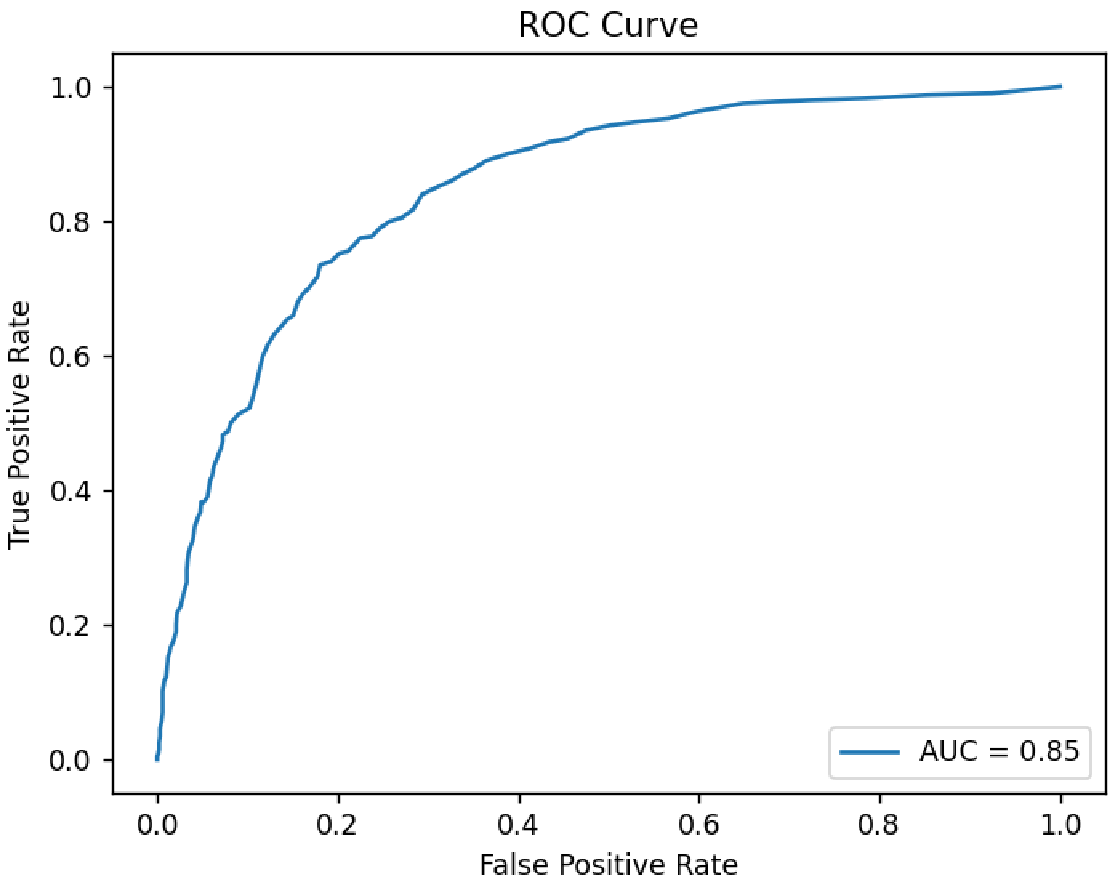
The feature importance plot shows the relative importance of the top 10 features in the model. The ROC curve shows the trade-off between the true positive rate and the false positive rate for different threshold values. The AUC score is a measure of the model's performance, with a higher score indicating better performance. The AUC score for this model is 0.8536, or 85%.



Confusion Matrix
True Label
Predicted Label
0
1
936
73
211
189
900
800
700
600
500
400
300
200
100



Feature Importance
Contract_Two year
Online Security_No
t Method_Electronic check
Tech Support_No
Longitude
Zip Code
Latitude
Contract_Month-to-month
Monthly Charges
Tenure Months
0.00
0.01
0.02
0.03
0.04
0.05


ROC Curve
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
AUC = 0.85

Iris

Code explanation:

This code demonstrates a common approach to solve a multi-class classification problem using the Random Forest Classifier. It begins by loading the Iris dataset and preprocessing it.

Next, it splits the dataset into training and testing sets using the train_test_split function from sklearn.
After that, it creates a Random Forest Classifier with 100 trees and trains it using the training data.
Then, it makes predictions on the testing data and calculates the accuracy score by comparing the predictions with the actual values.
It also prints the confusion matrix, which is a table that describes the performance of the classifier by comparing predicted values with actual values.
The code further plots the confusion matrix and the feature importance, which represents the value of each feature in improving the classifier's performance.

Here is the breakdown of the code:

1.Load the Iris dataset using the pandas library.

2.Convert the 'species' column into numerical values using the LabelEncoder class from sklearn.preprocessing.

3.Split the dataset into training and testing sets using the train_test_split function from sklearn.model_selection.

4.Create a Random Forest Classifier with 100 trees using the RandomForestClassifier class from sklearn.ensemble.

5.Train the classifier using the training data.

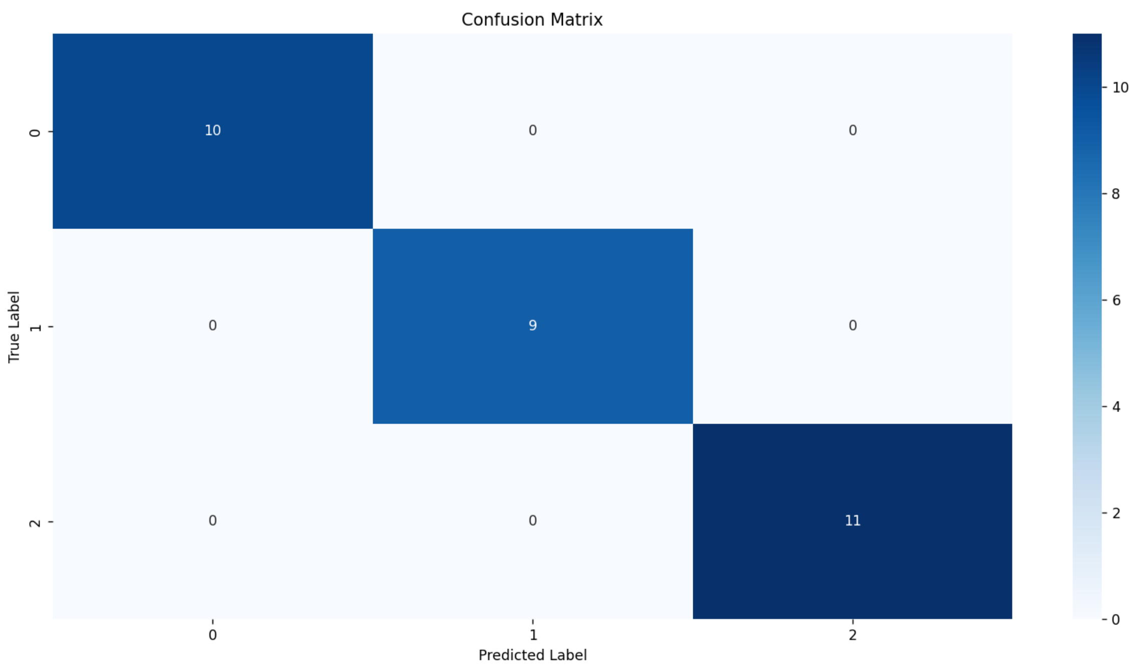
6.Make predictions on the testing data.

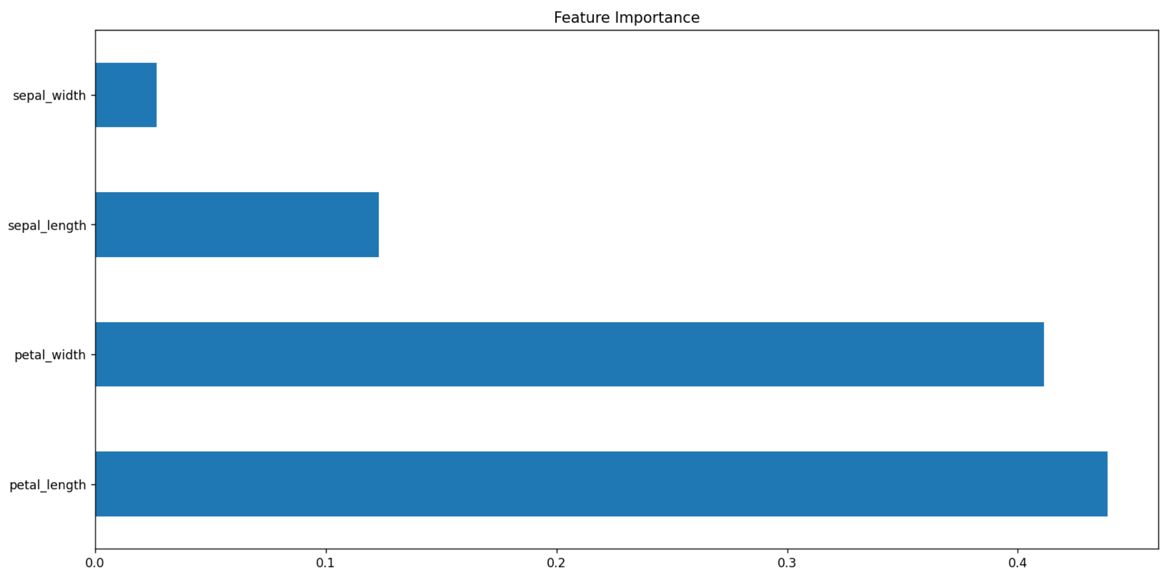
7.Calculate the accuracy score of the classifier using the accuracy_score function from sklearn.metrics.

8.Print the confusion matrix and accuracy score.

9.Plot the confusion matrix using the seaborn library.

10.Plot the feature importance of the Random Forest Classifier.


Confusion Matrix
True Label
Predicted Label
0
1
2
10
9
11
0
2
4
6
8
10


Feature Importance
sepal_width
sepal_length
petal_width
petal_length
0.0
0.1
0.2
0.3
0.4