Fake Currency Detection For Classification Project

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The Problem

Fake Currency Detection is a real problem for both individuals and businesses. Counterfeiters are constantly finding new methods and techniques to produce counterfeit banknotes, which are essentially indistinguishable from real money. At least for the human eye.

Is That Real?

Identification and Assessment of the Counterfeiting Threat to Banknotes .

Model Target

Data Source

The data set that was used for fake currency detection from http://archive.ics.uci.edu/ml/datasets/banknote+authentication.UCI Machine Learning Repository

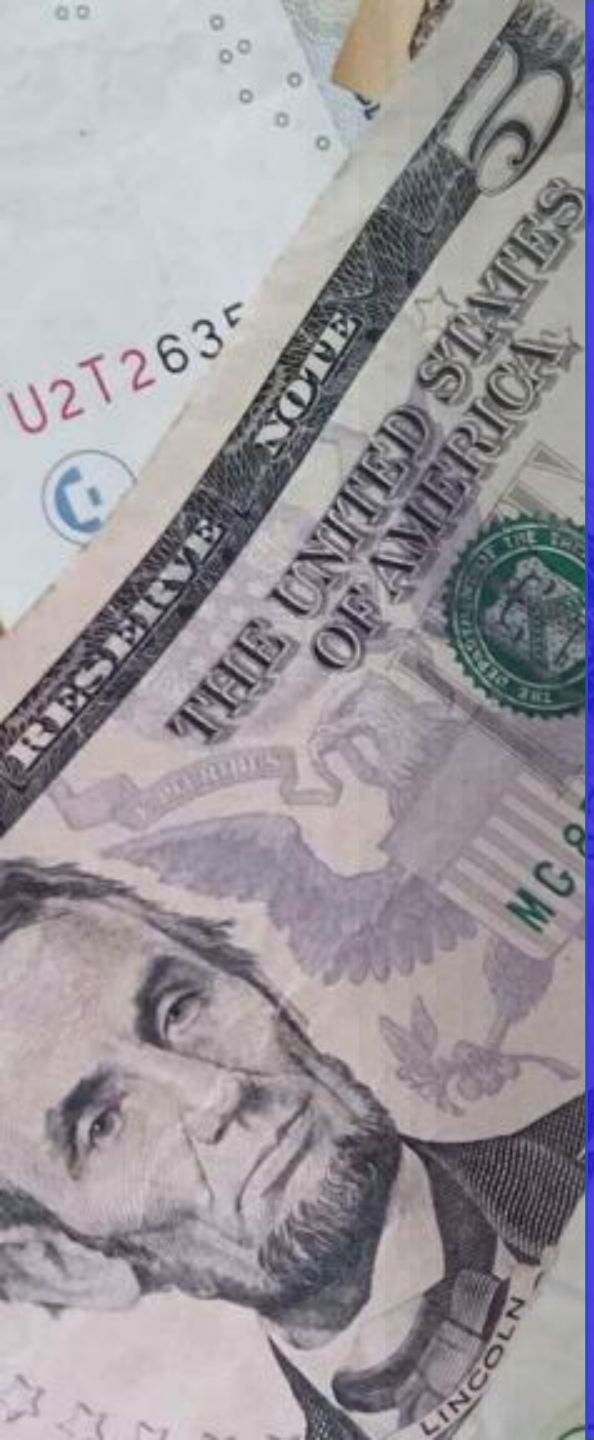
The features we are looking for:

Variance

Skewness

curtosis

entropy



Classification project performance

Data Exploration
Data Processing
train_test_split
StandardScaler
Logistic Regressing
Algorithm

Results

The Results are represented in:
Graphics and different confusion matrix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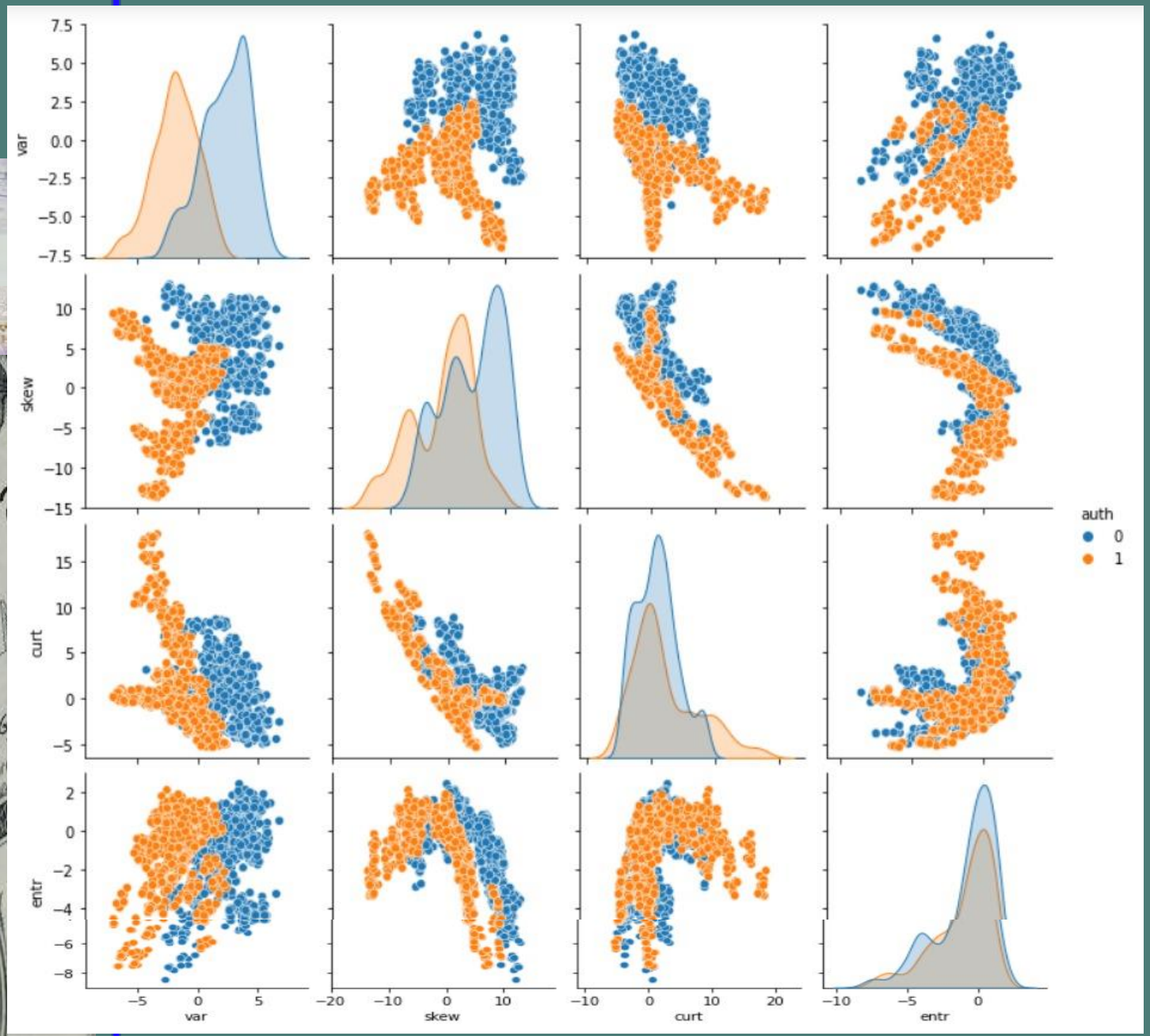
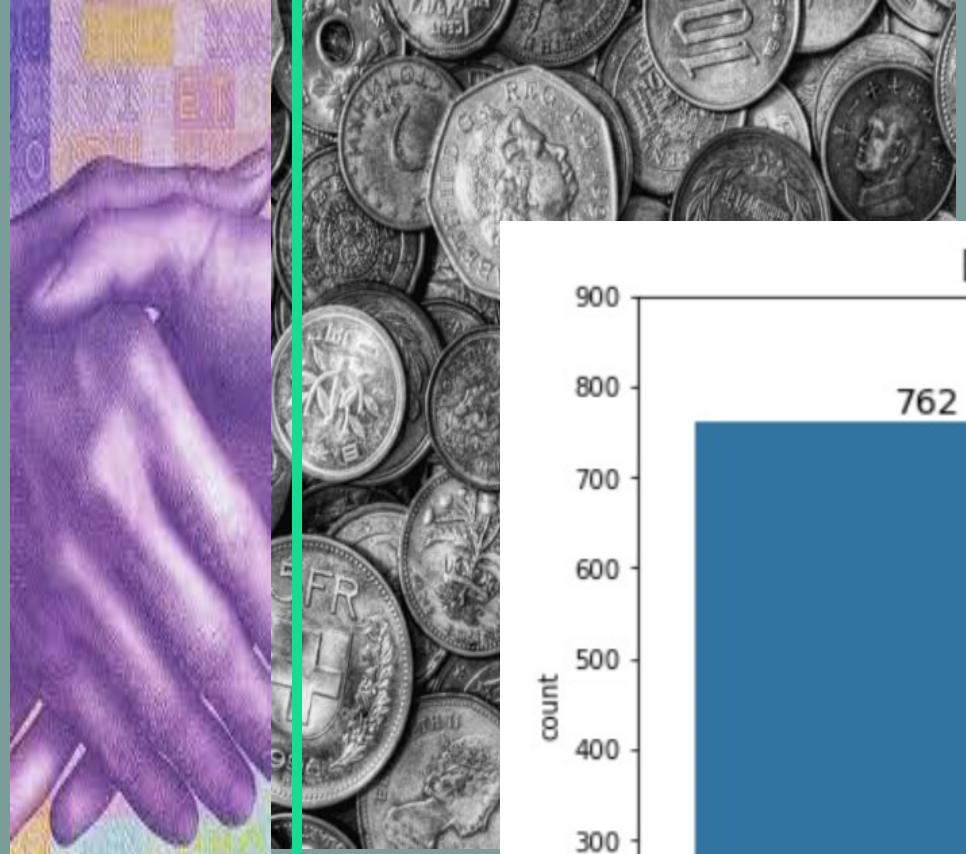
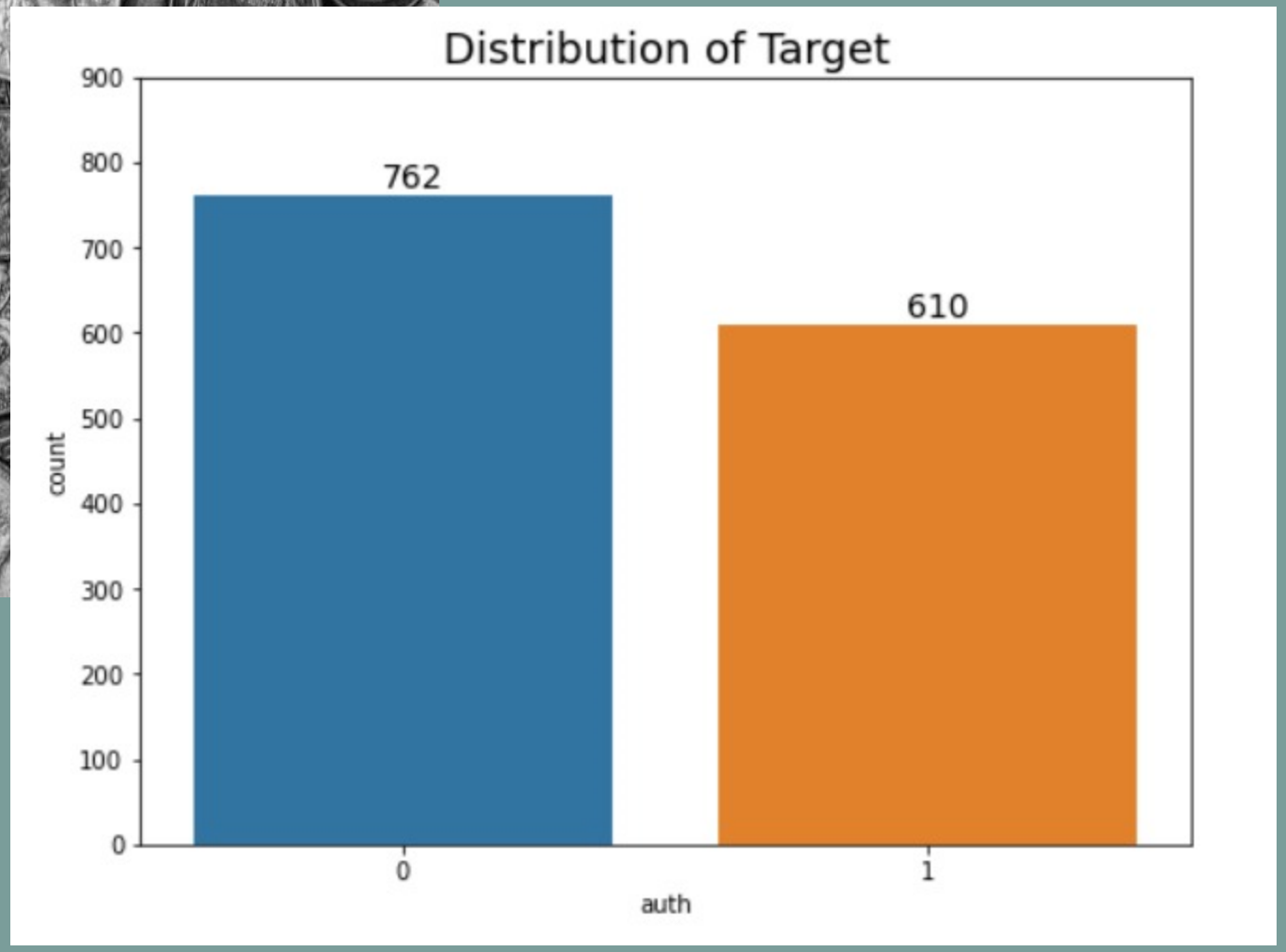

var
skew
curt
entr
auth
0
1




Distribution of Target
900
800
700
600
500
400
300
200
100
0
count
762
610
0
1
auth

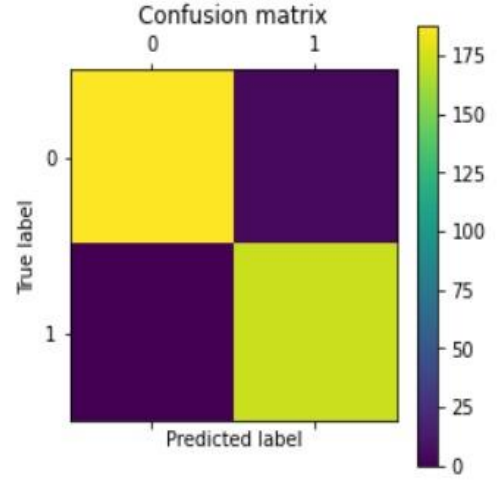
f1_score: 0.9954337899543378

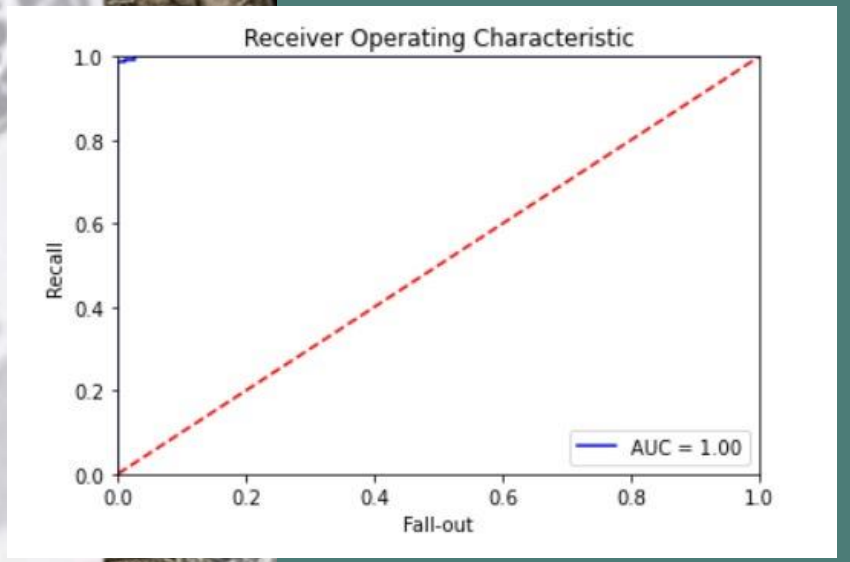
	Pred.Negative	Pred.Positive
Act.Negative	187	6
Act.Positive	0	173

Accuracy = 98.36%

roc_auc_score: 0.9870466321243524

```
[[188   5]
 [  0 173]]
```

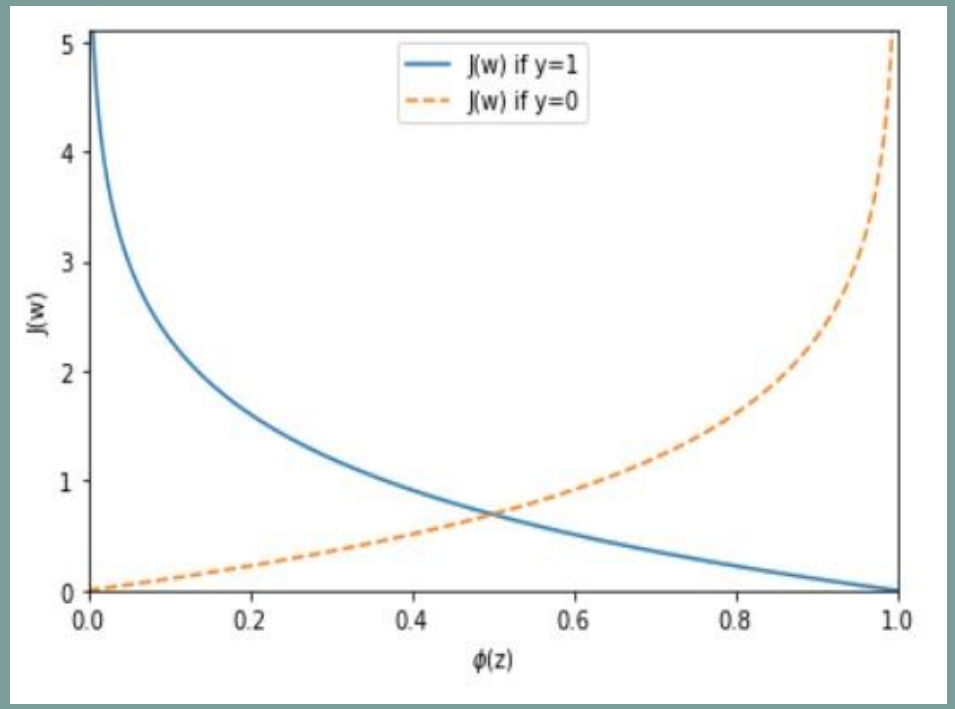

Confusion matrix
0
1
0
1
True label
Predicted label
175
150
125
100
75
50
25
0


Receiver Operating Characteristic
Recall
Fall-out
AUC = 1.00
0.0
0.2
0.4
0.6
0.8
1.0

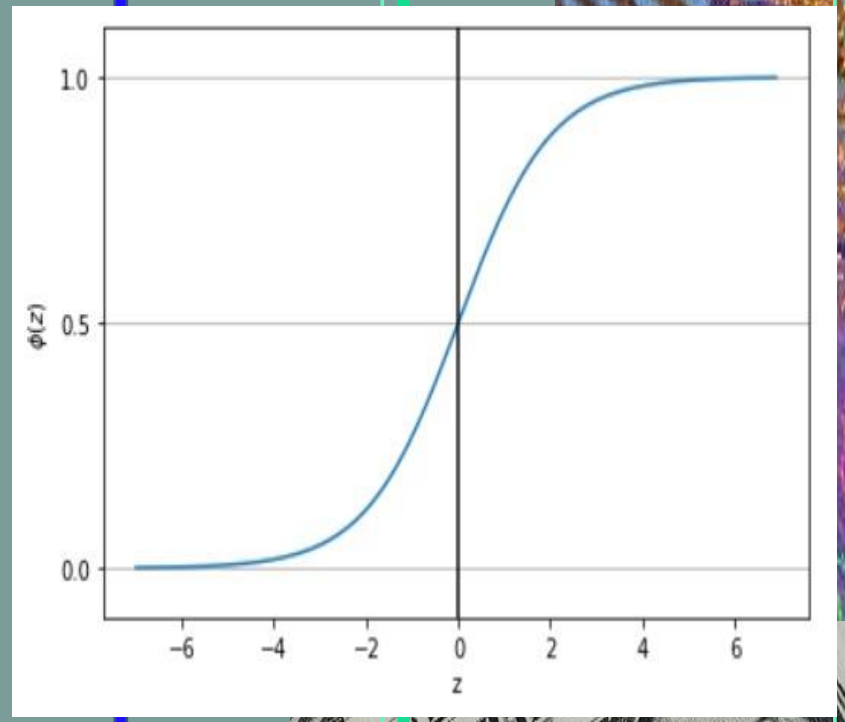
5

5

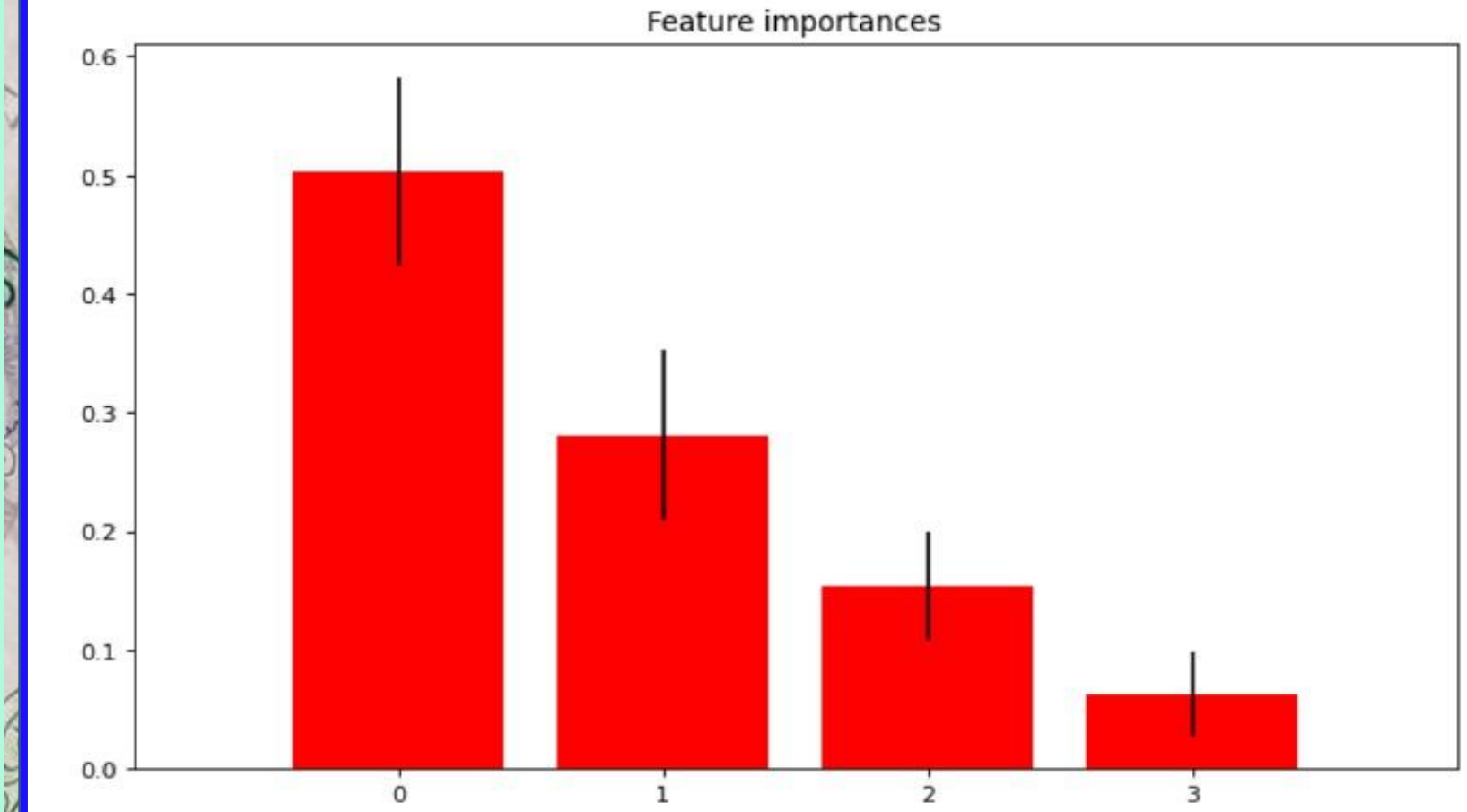
The weights of the logistic cost function



The sigmoid function



```
Feature ranking:
1. feature 0 - var (0.502450)
2. feature 1 - skew (0.280639)
3. feature 2 - curt (0.153946)
4. feature 3 - entr (0.062965)
```



TOOLS

Pandas
Numpy
Matplotlib
Seaborn
sklearn(model_selection,
Preprocessing,
linear_model,
confusion_matrix,
Ensemble).

Conclusion

Our model predicts that this banknote is real.

```
Prediction:  Class0
Probability [0/1]:  [0.61112576 0.38887424]
```

Thank You