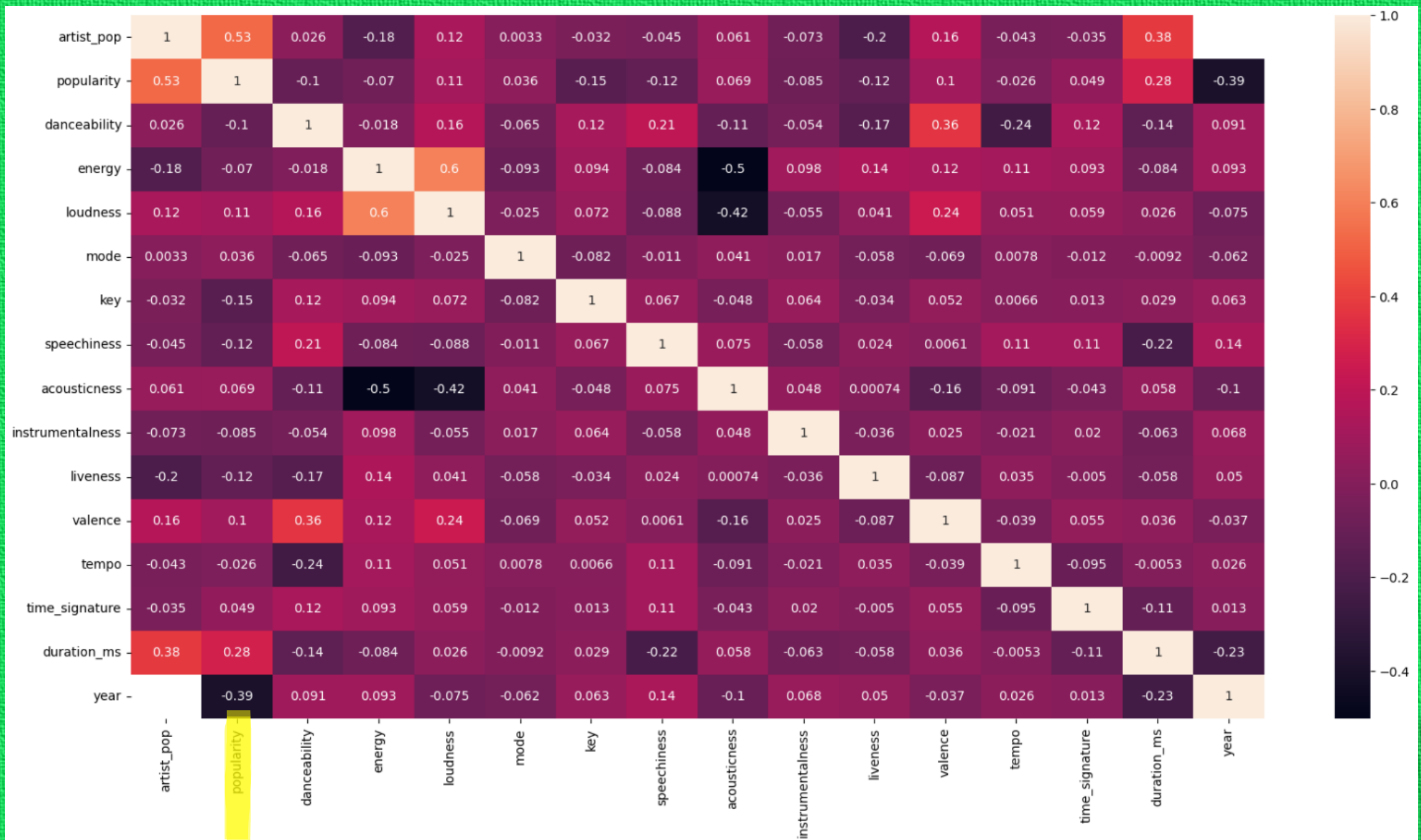
The background is a dark blue-purple field filled with various colorful, rounded rectangular and circular shapes in shades of teal, green, orange, and red. A thin teal rectangular border is positioned on the left and top, enclosing the main text area.

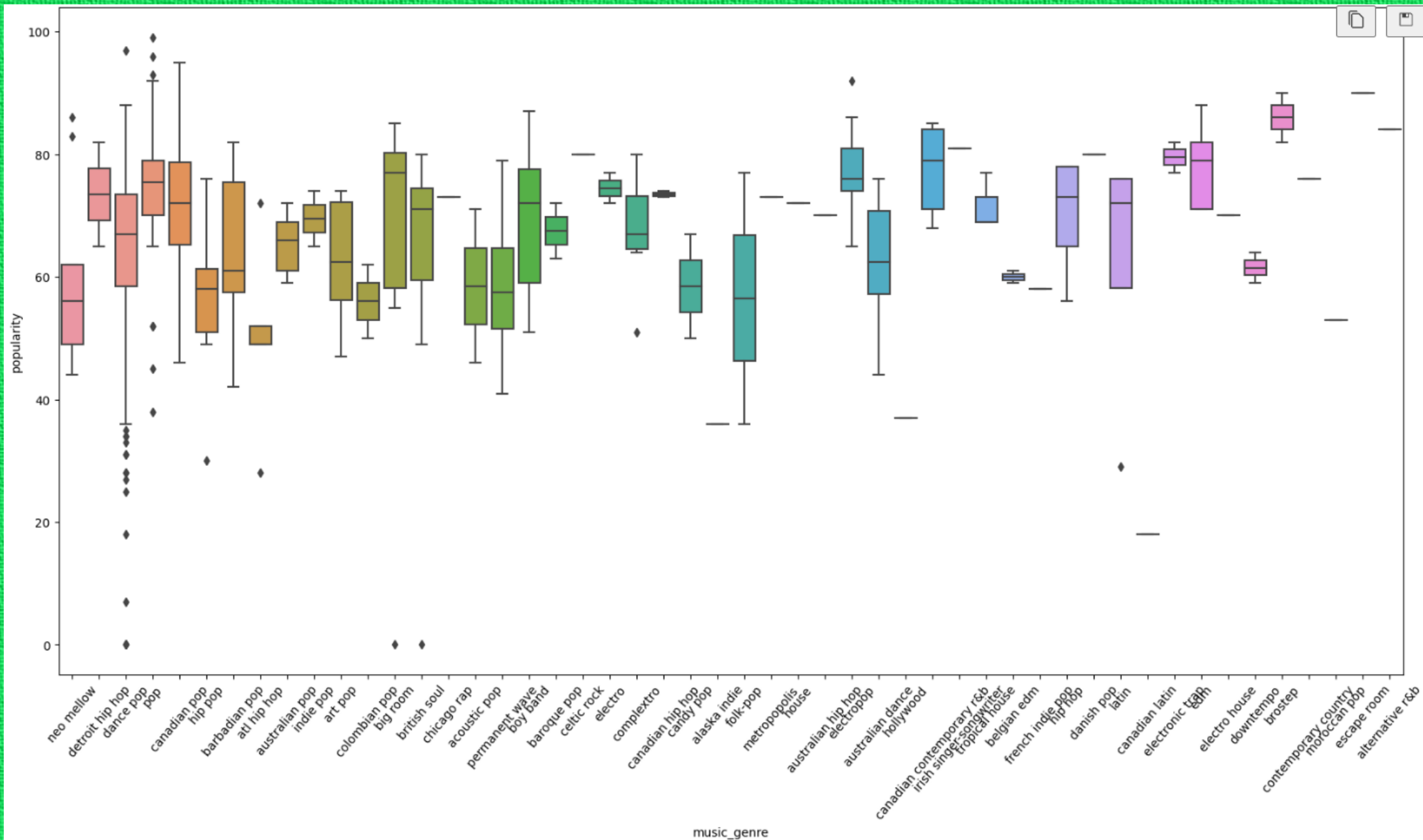
MACHINE LEARNING PROJECT

Lili Casanova de Utrilla



	track_name	artist_name	artist_pop	album	popularity	danceability	energy	loudness	mode	key	...	acousticness	instrumentalness	liveness	valence
0	Running Up That Hill (A Deal With God)	Kate Bush	81.0	Hounds Of Love	95.0	0.629	0.547	-13.123	0.0	10.0	...	0.7200	0.003140	0.0604	0.197
1	As It Was	Harry Styles	91.0	As It Was	96.0	0.520	0.731	-5.338	0.0	6.0	...	0.3420	0.001010	0.3110	0.662
2	Sunroof	Nicky Youre	73.0	Sunroof	44.0	0.768	0.716	-5.110	1.0	10.0	...	0.3500	0.000000	0.1500	0.841
3	Heat Waves	Glass Animals	80.0	Dreamland (+ Bonus Levels)	89.0	0.761	0.525	-6.900	1.0	11.0	...	0.4400	0.000007	0.0921	0.531
4	About Damn Time	Lizzo	81.0	About Damn Time	92.0	0.836	0.743	-6.305	0.0	10.0	...	0.0995	0.000000	0.3350	0.722





Veo que mi mejor salida de profundidad es 25, vuelvo a entrenar mi modelo Random Forest

```
best_rnd_clf = RandomForestClassifier(n_estimators=100, random_state=42,  
                                     max_depth=25, min_samples_split=2, criterion='gini')  
best_rnd_clf.fit(X_train, Y_train)  
  
y_pred_rf = best_rnd_clf.predict(X_test)  
  
print('Accuracy ', accuracy_score(Y_test, y_pred_rf))  
print('\n')  
print('F1 Score ', f1_score(Y_test, y_pred_rf))  
print('\n')  
print('ROC AUC Score ', roc_auc_score(Y_test, y_pred_rf))  
print('\n')
```

Accuracy 0.7927736450584485

F1 Score 0.8024316109422492

ROC AUC Score 0.7926258537819377

Training score

Accuracy: 1.0

F1: 1.0

Precision: 1.0

Recall: 1.0

Test score

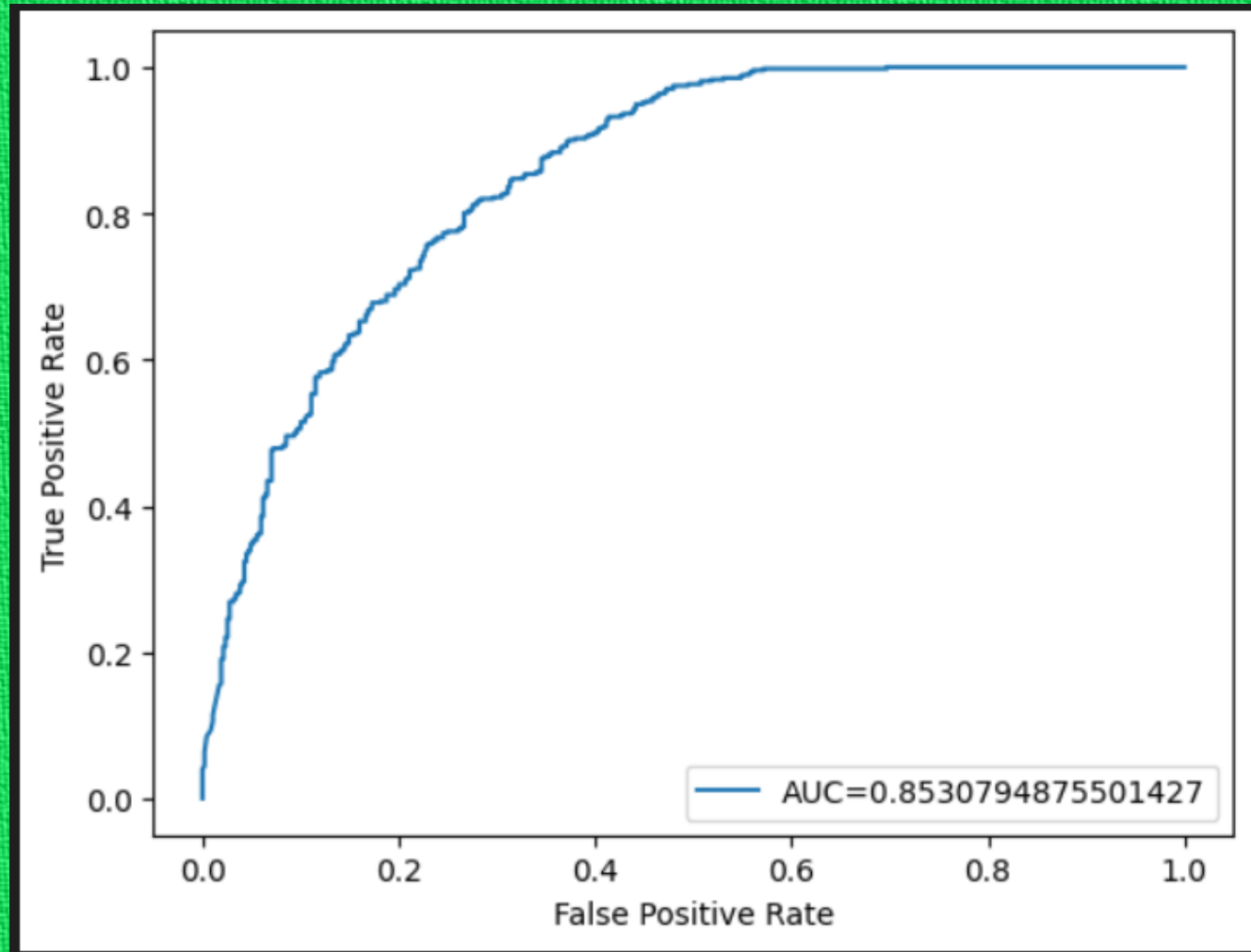
Accuracy: 0.7927736450584485

F1: 0.8024316109422492

Precision: 0.7689320388349514

Recall: 0.8389830508474576

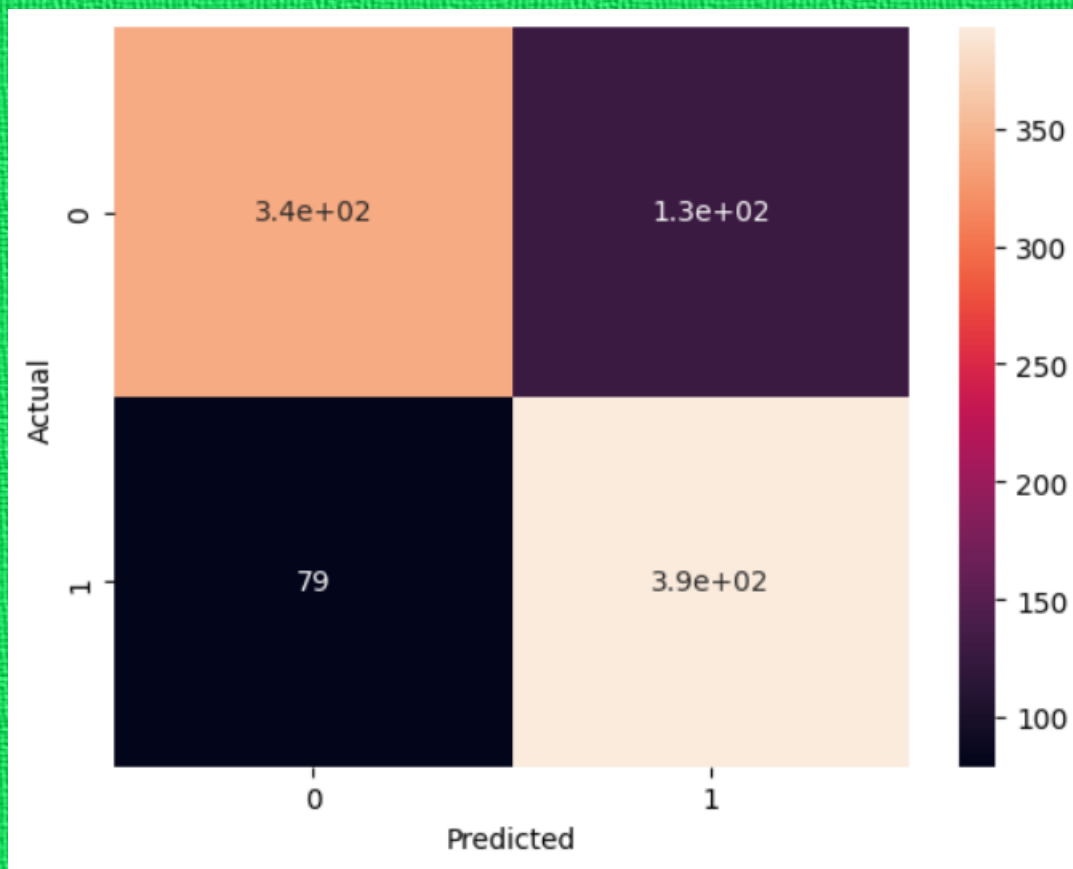
XGBoost



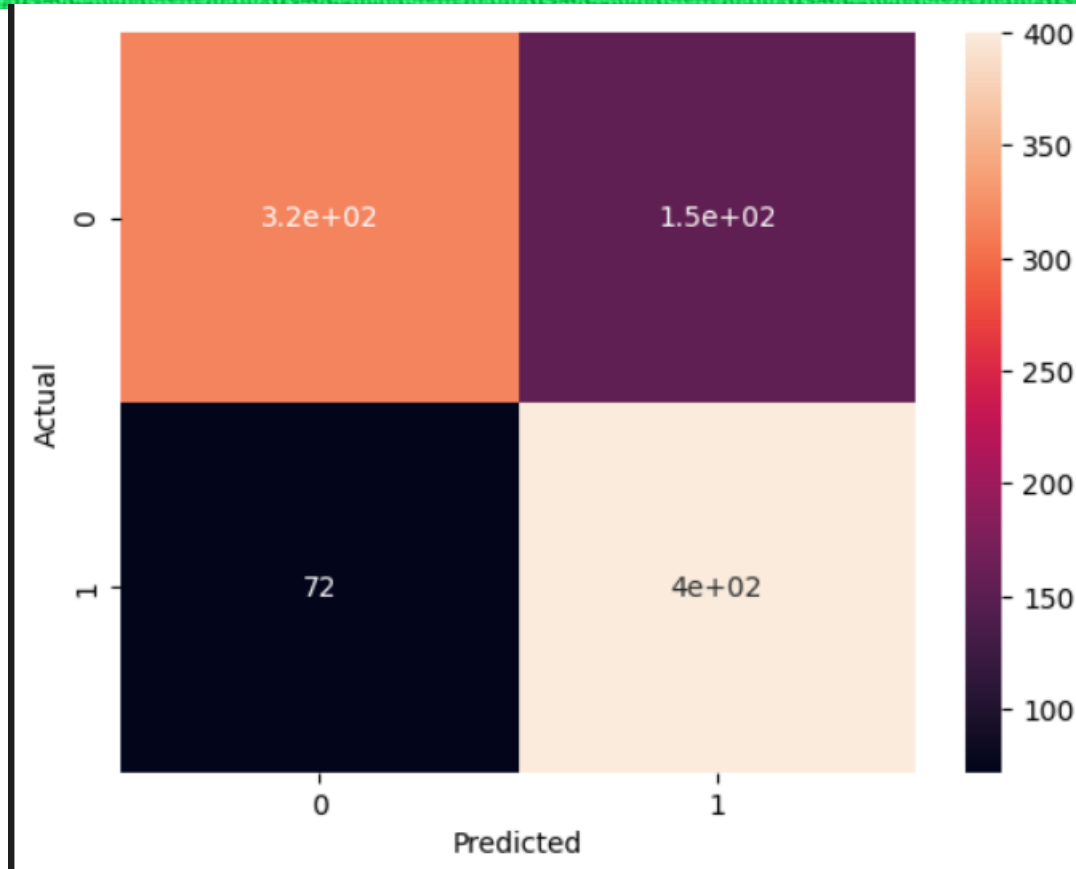
XGBoost

```
... booster[0]:
  0:[loudness<-12.0079994] yes=1,no=2,missing=1,gain=659.903687,cover=752.25
    1:[energy<0.421499997] yes=3,no=4,missing=3,gain=30.4569092,cover=162.5
      3:[speechiness<0.0295000002] yes=7,no=8,missing=7,gain=2.93438721,cover=148
        7:[danceability<0.460000008] yes=15,no=16,missing=15,gain=2.72724104,cover=2.75
          15:leaf=-0.0199998394,cover=1.25
          16:leaf=-0,cover=1.5
        8:[danceability<0.558500051] yes=17,no=18,missing=17,gain=1.57971191,cover=145.25
          17:[acousticness<0.721500039] yes=29,no=30,missing=29,gain=0.17755127,cover=132
            29:[danceability<0.488999993] yes=47,no=48,missing=47,gain=0.799982071,cover=5
              47:leaf=-0.0199999493,cover=4
              48:leaf=-0.00999989919,cover=1
            30:[speechiness<0.0318500027] yes=49,no=50,missing=49,gain=0.392089844,cover=127
              49:leaf=-0.0159999356,cover=2.5
              50:leaf=-0.0199999977,cover=124.5
            18:[acousticness<0.0617499985] yes=31,no=32,missing=31,gain=2.84790039,cover=13.25
              31:leaf=-0,cover=1
              32:[valence<0.270999998] yes=51,no=52,missing=51,gain=1.36285019,cover=12.25
                51:leaf=-0.00999994949,cover=2
                52:leaf=-0.0190243721,cover=10.25
          4:[instrumentalness<0.0164499991] yes=9,no=10,missing=9,gain=17.7736111,cover=14.5
            9:[danceability<0.594500005] yes=19,no=20,missing=19,gain=7.25936317,cover=9.75
              19:[instrumentalness<1.80499992e-05] yes=33,no=34,missing=33,gain=3.68417311,cover=4.75
                33:leaf=-0.0199998394,cover=1.25
                34:[danceability<0.430000007] yes=53,no=54,missing=53,gain=5.59995365,cover=3.5
                ...
                68:leaf=-0,cover=2
                44:leaf=-0.0199997984,cover=1
                28:leaf=-0.00666662212,cover=1.5
```


RANDOM FOREST



XGBOOST CLASSIFIER



¡¡¡MUCHAS GRACIAS!!!

