

# Experiment 8

## 1. Regression

Mean Squared Error: 115.41

R<sup>2</sup> Score: 0.76

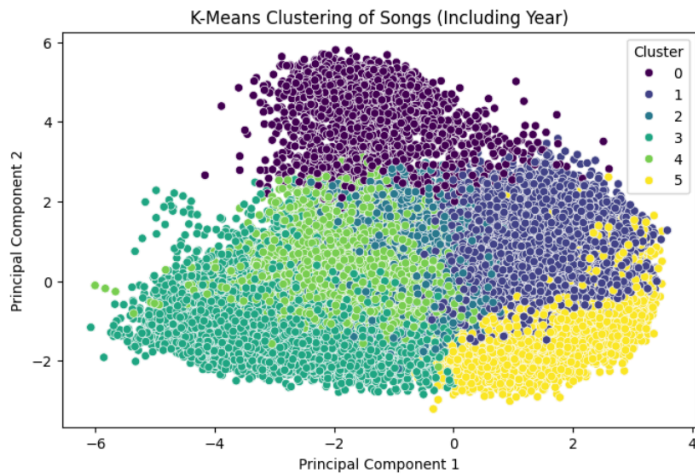
## 2. Classification

Accuracy: 0.95

Confusion Matrix:

```
[[30750  439]
 [ 1213 1729]]
```

## 3. Clustering



	year	danceability	energy	loudness	speechiness	acousticness	tempo	Cluster
0	1921	0.279	0.211	-20.096	0.0366	0.982	80.954	3
1	1921	0.819	0.341	-12.441	0.4150	0.732	60.936	4
2	1921	0.328	0.166	-14.850	0.0339	0.961	110.339	3
3	1921	0.275	0.309	-9.316	0.0354	0.967	100.109	4
4	1921	0.418	0.193	-10.096	0.0380	0.957	101.665	4

## 4. Decision Tree

Accuracy: 0.94

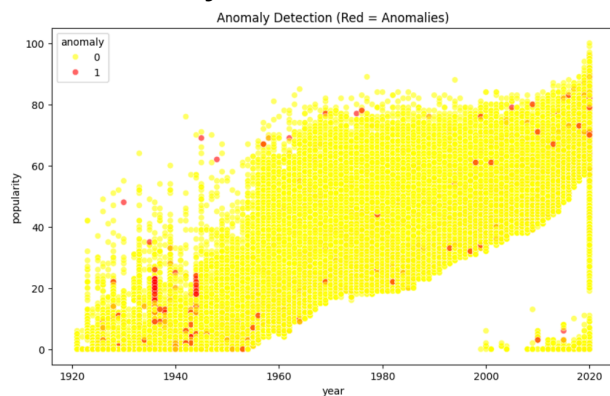
Confusion Matrix:

```
[[30293  896]
 [ 1229 1713]]
```

Classification Report:

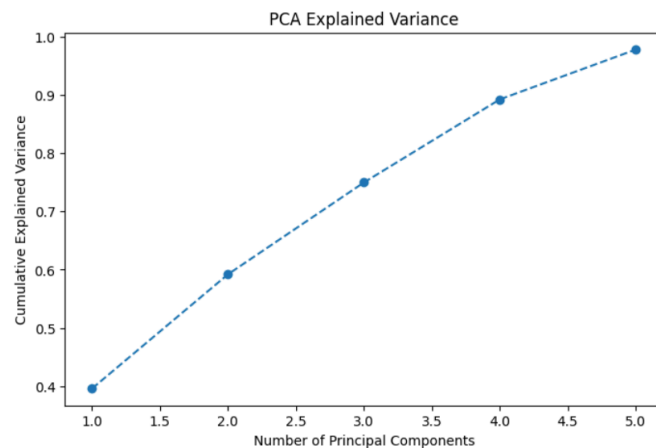
	precision	recall	f1-score	support
0	0.96	0.97	0.97	31189
1	0.66	0.58	0.62	2942
accuracy			0.94	34131
macro avg	0.81	0.78	0.79	34131
weighted avg	0.93	0.94	0.94	34131

## 5. Anomaly Detection



Total Anomalies Detected: 3414

## 6. Dimensionality Reduction



Number of Principal Components Retained: 5

## 7. Ensemble Methods

### - Bagging

Bagging Regression MSE: 0.04

Bagging Regression  $R^2$ : 0.54

### - Boosting

AdaBoost Regression MSE: 0.06

AdaBoost Regression  $R^2$ : 0.26

### - Stacking

Stacking Regression MSE: 0.04

Stacking Regression  $R^2$ : 0.50