rotten-tomatoes-2f

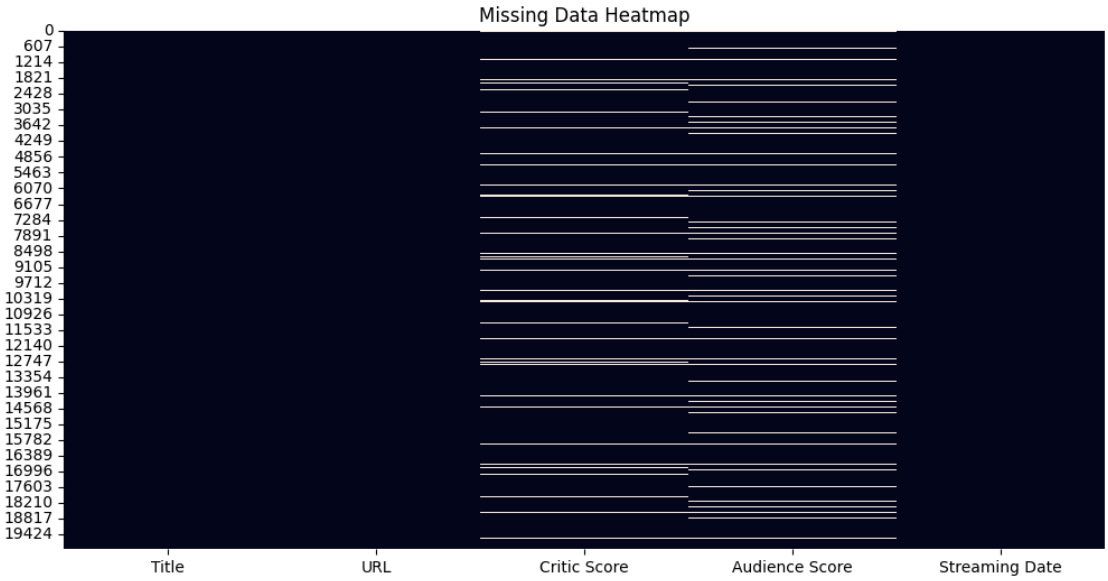
October 9, 2024

[126]:
```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score
from sklearn.preprocessing import LabelEncoder
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import confusion_matrix, precision_recall_fscore_support,␣
↪accuracy_score
import matplotlib.pyplot as plt
import seaborn as sns
```

[127]:
```
# Load the data
data = pd.read_csv('/content/movies.csv')
# Preprocessing
print(data['Audience Score'].isnull().sum())
```

```
2020
```

[128]:
```
plt.figure(figsize=(12, 6))
sns.heatmap(data.isnull(), cbar=False)
plt.title('Missing Data Heatmap')
plt.show()
```



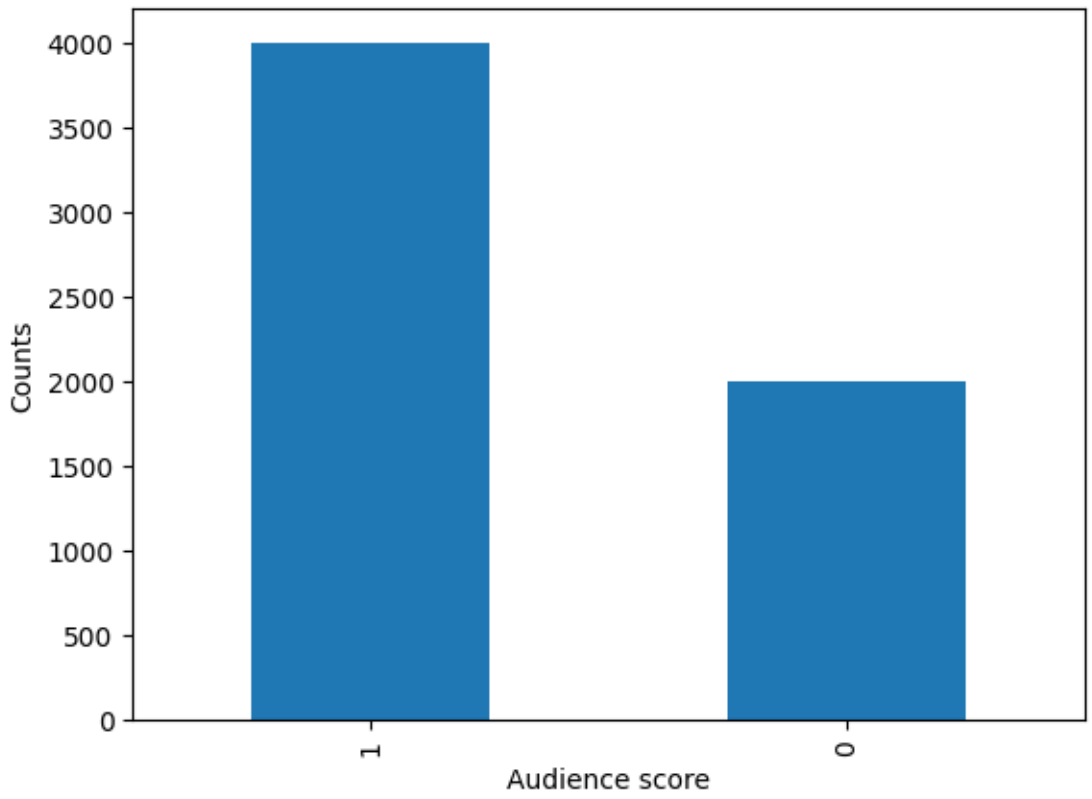
[129]:
```
data = data.dropna(subset=['Audience Score'])
```

[130]:
```
#'Audience Score' is the column with audience scores
data['audience_score_binary'] = (data['Audience Score'] >= 50).astype(int)
data.drop(columns=['Audience Score'], inplace=True)

le = LabelEncoder()
for column in data.columns[data.dtypes == 'object']:
    data[column] = le.fit_transform(data[column])
```

```
<ipython-input-130-07156e957556>:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  data['audience_score_binary'] = (data['Audience Score'] >= 50).astype(int)
<ipython-input-130-07156e957556>:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  data.drop(columns=['Audience Score'], inplace=True)
<ipython-input-130-07156e957556>:7: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
```

```
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  data[column] = le.fit_transform(data[column])
<ipython-input-130-07156e957556>:7: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  data[column] = le.fit_transform(data[column])
```

[131]:
```
# Filter the positive and negative classes
positive_class = data[data['audience_score_binary'] == 1]
negative_class = data[data['audience_score_binary'] == 0]

positive_sample = positive_class.sample(n=4000, random_state=42) if␣
 ↪len(positive_class) > 4000 else positive_class

balanced_data = pd.concat([positive_sample, negative_class])

balanced_data = balanced_data.sample(frac=1, random_state=42).
 ↪reset_index(drop=True)

balanced_data['audience_score_binary'].value_counts().plot(kind='bar')
plt.xlabel('Audience score')
plt.ylabel('Counts')
plt.show()
```



[132]:
```
# Split data
X = balanced_data.drop('audience_score_binary', axis=1)
y = balanced_data['audience_score_binary']
```

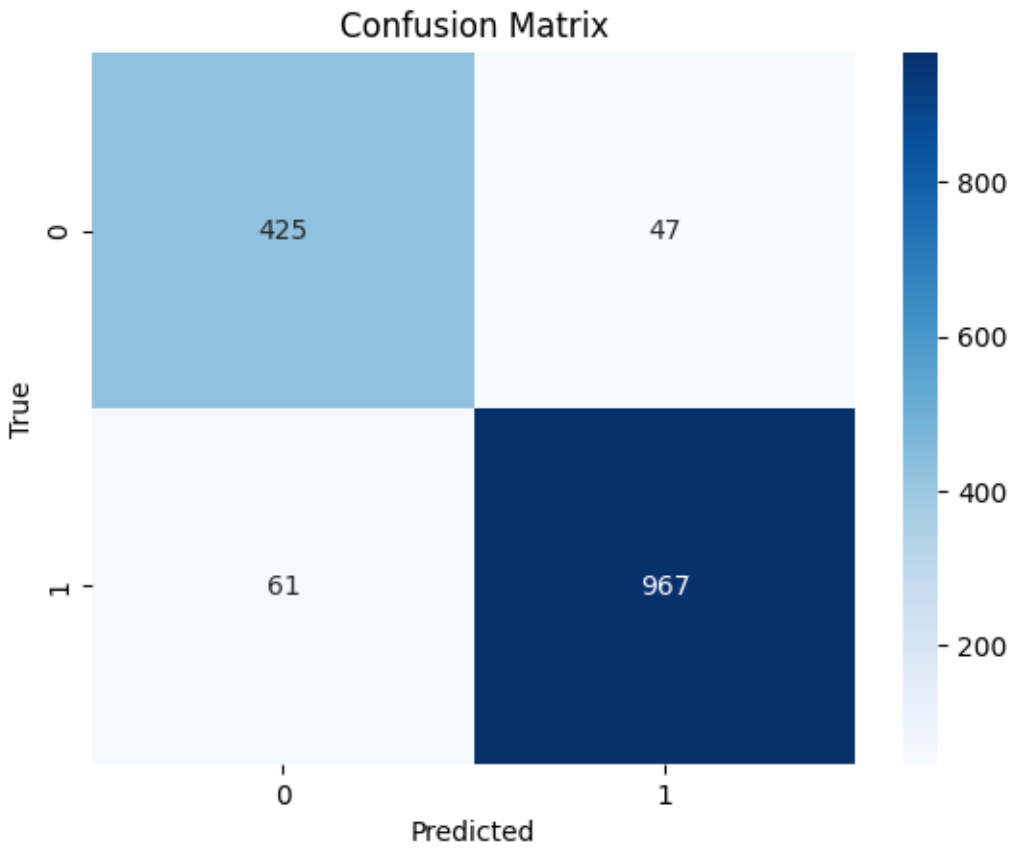
[133]:
```
from sklearn.impute import SimpleImputer
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import RandomForestClassifier
from sklearn.tree import DecisionTreeClassifier
from sklearn.svm import SVC
from sklearn.pipeline import Pipeline
from sklearn.model_selection import train_test_split
from sklearn.metrics import classification_report, confusion_matrix,␣
 ↪precision_recall_fscore_support


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.25,␣
 ↪random_state=42)


imputer = SimpleImputer(strategy='median')
```

```
# Create a SVM model
model = SVC()


pipeline = Pipeline([
    ('imputer', imputer),
    ('SVM', model)
])


pipeline.fit(X_train, y_train)

y_pred = pipeline.predict(X_test)
```

[134]:
```
# Accuracy
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

```
Accuracy: 0.928
```

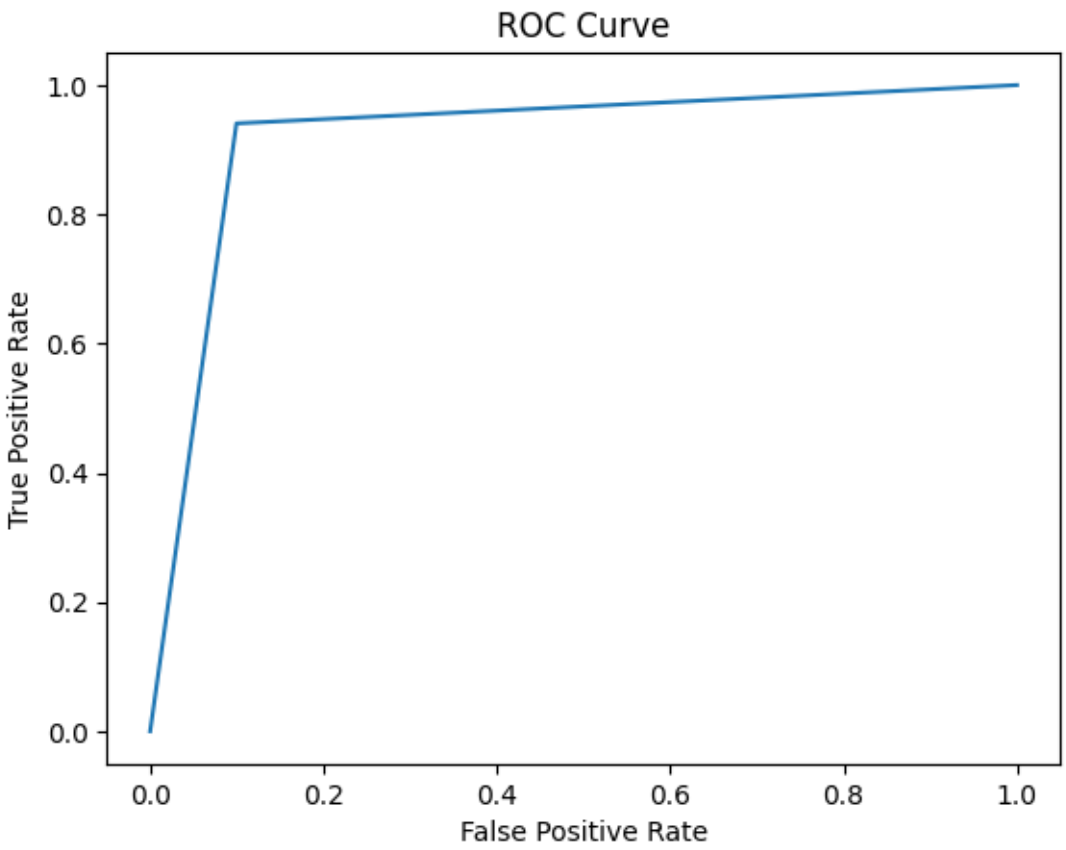
[135]:
```
# Confusion Matrix
cm = confusion_matrix(y_test, y_pred)
sns.heatmap(cm, annot=True, fmt='d', cmap='Blues')
plt.title('Confusion Matrix')
plt.xlabel('Predicted')
plt.ylabel('True')
plt.show()

precision, recall, f1, _ = precision_recall_fscore_support(y_test, y_pred,␣
 ↪average='binary')
print("Precision:", precision)
print("Recall:", recall)
print("F1 Score:", f1)
```




```
Precision: 0.9536489151873767
Recall: 0.9406614785992218
F1 Score: 0.9471106758080314
```

[136]:
```
from sklearn.metrics import roc_curve, roc_auc_score
from sklearn.metrics import RocCurveDisplay

fpr, tpr, thresholds = roc_curve(y_test, y_pred)

plt.figure(figsize=(8, 6))
RocCurveDisplay(fpr=fpr, tpr=tpr).plot()
plt.title('ROC Curve')
plt.show()
```

```
<Figure size 800x600 with 0 Axes>
```



[137]:
```
import pandas as pd
df = pd.read_csv("/content/movies.csv")
df
```

[137]:

	Title	URL	Critic Score
0	Abigail	https://www.rottentomatoes.com/m/abigail_2024	84.0
1	Ghostbusters: Frozen Empire	https://www.rottentomatoes.com/m/ghostbusters_…	43.0
2	Wicked Little Letters		
3	Billy & Molly: An Otter Love Story		
4	Founders Day		
…	…		
19997	Saltburn		
19998	Parasite		
19999	Ordinary Angels		
20000	No Hard Feelings		
20001	The Equalizer 3		

```
2      https://www.rottentomatoes.com/m/wicked_little…          79.0
3      https://www.rottentomatoes.com/m/billy_and_mol…         100.0
4          https://www.rottentomatoes.com/m/founders_day          46.0
…                                                    …           …
19997          https://www.rottentomatoes.com/m/saltburn          71.0
19998     https://www.rottentomatoes.com/m/parasite_2019          99.0
19999   https://www.rottentomatoes.com/m/ordinary_angels          85.0
20000  https://www.rottentomatoes.com/m/no_hard_feeli…          70.0
20001   https://www.rottentomatoes.com/m/the_equalizer_3          76.0

       Audience Score          Streaming Date
0                85.0   Streaming May 7, 2024
1                83.0   Streaming May 7, 2024
2                91.0   Streaming May 7, 2024
3               100.0   Streaming May 7, 2024
4                12.0   Streaming May 7, 2024
…                …                       …
19997            79.0  Streaming Dec 22, 2023
19998            90.0  Streaming Oct 11, 2019
19999            99.0  Streaming Mar 26, 2024
20000            87.0  Streaming Aug 15, 2023
20001            94.0   Streaming Oct 3, 2023

[20002 rows x 5 columns]
```