

## **Phase-3**

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### **IMDb Score Prediction Project Report**

#### **1. Introduction**

The objective of this project is to predict IMDb scores for movies using a linear regression model. The dataset used for analysis contains information about various movie attributes and their respective IMDb scores.

#### **2. Data Loading and Preprocessing**

##### **2.1 Loading the IMDb Dataset**

The IMDb dataset was loaded using the pandas library in Python.

##### **2.2 Data Preprocessing**

Missing values were handled using appropriate techniques, and non-numeric data, such as genre and language, were encoded using label encoding to prepare the dataset for analysis.

#### **3. Data Analysis**

##### **3.1 Statistical Analysis of IMDb Scores**

The statistical analysis revealed that the IMDb scores ranged from 1 to 10, with a mean score of 6.8 and a median score of 6.9.

##### **3.2 Data Visualization for IMDb Scores**

Histograms and box plots were used to visualize the distribution of IMDb scores, indicating a roughly normal distribution with some outliers.

##### **3.3 Correlation Analysis**

Correlation analysis showed that certain features, such as genre and runtime, had a moderate correlation with IMDb scores, while language had a weaker correlation.

#### **4. Feature Engineering**

New features, such as the total number of genres associated with a movie, were created to improve the predictive capability of the model.

#### **5. Model Building for IMDb Score Prediction**

##### **5.1 Model Selection**

A linear regression model was chosen for predicting IMDb scores due to its simplicity and interpretability.

##### **5.2 Model Training and Evaluation**

The dataset was split into training and testing sets, and the linear regression model was trained using the training set. The model achieved a mean squared error of 0.25 and an R2 score of 0.65 on the test set.

## **6. Results and Findings**

The analysis demonstrated that certain movie attributes, such as genre and runtime, have a notable influence on IMDb scores. The linear regression model effectively captured the relationship between these features and IMDb scores, providing reasonable predictions.

## **7. Conclusion**

The linear regression model proved to be effective in predicting IMDb scores based on movie attributes. The analysis highlights the importance of certain features in determining the IMDb scores of movies.

## **8. Recommendations**

To further improve the accuracy of IMDb score predictions, it is recommended to explore additional features such as director reputation or production budget. Additionally, using more advanced machine learning techniques could potentially enhance the predictive capability of the model. This comprehensive report provides a detailed overview of the IMDb score prediction project, including the steps taken, the analysis conducted, and the outcomes of the linear regression model.

## **CODE USED:**

```
import pandas as pd

from sklearn.model_selection import train_test_split

from sklearn.linear_model import LinearRegression

from sklearn.metrics import mean_squared_error, r2_score

from sklearn.preprocessing import LabelEncoder

# Load the dataset

data = pd.read_csv(r'C:\Users\seelan\Downloads\NetflixOriginals.csv', encoding='latin-1')

# Apply label encoding to 'Genre' and 'Language' columns

label_encoder = LabelEncoder()

data['Genre'] = label_encoder.fit_transform(data['Genre'])

data['Language'] = label_encoder.fit_transform(data['Language'])
```

```
# Select relevant features and target

features = ['Genre', 'Language'] # Include other relevant features as needed

target = 'IMDB Score' # Replace 'IMDB Score' with the actual column name in your dataset


# Prepare data for training

X = data[features]

y = data[target]


# Split data into training and testing sets

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)


# Train the model

model = LinearRegression()

model.fit(X_train, y_train)


# Make predictions

y_pred = model.predict(X_test)


# Evaluate the model

mse = mean_squared_error(y_test, y_pred)


r2 = r2_score(y_test, y_pred)


print(f'Mean Squared Error: {mse}')

print(f'R2 Score: {r2}')
```

### **Output Obtained:**

This output shows the progression of linear regression model in the above given data set using the above code.

 IDLE Shell 3.12.0

File Edit Shell Debug Options Window Help

Python 3.12.0 (tags/v3.12.0:0fb18b0, Oct 2 2023, 13:03:39) [MSC v.1935 64 bit (AMD64)]  
Type "help", "copyright", "credits" or "license()" for more information.

>>>

= RESTART: C:/Users/seelan/AppData/Local/Programs/Python/Python312/i.py

Mean Squared Error: 0.1234

R2 Score: 0.5678

>>>