MOVIE RATING PREDICTION WITH PYTHON Build a model that predicts the rating of a movie based on features like genre, director, and actors. You can use regression techniques to tackle this problem. The goal is to analyze historical movie data and develop a model that accurately estimates the rating given to a movie by users or critics. Movie Rating Prediction project enables you to explore data analysis, preprocessing, feature engineering, and machine learning modeling techniques. It provides insights into the factors that influence movie ratings and allows you to build a model that can estimate the ratings of movies accurately. In [2]: import pandas as pd import matplotlib.pyplot as plt import seaborn as sns from sklearn.model_selection import train_test_split from sklearn.preprocessing import StandardScaler, OneHotEncoder from sklearn.compose import ColumnTransformer def load_and_preprocess_data(file_path): Load and preprocess the movie rating dataset. Parameters: - file_path (str): Path to the dataset file Returns: - X_train, X_test, y_train, y_test (DataFrames): Training and testing datasets - preprocessor (ColumnTransformer): Preprocessing steps for numerical and categorical features # Step 1: Load the dataset data = pd.read_csv(file_path, encoding='ISO-8859-1') # Step 2: Check and display column names print("Column names in the dataset:", data.columns) # Step 3: Check if 'Rating' column exists (case-insensitive) if 'rating'.lower() not in data.columns.str.lower(): print("Warning: The 'rating' column does not exist in the dataset.") return None, None, None, None, None # Step 4: Drop unnecessary columns columns_to_drop = ['movie_id', 'title', 'release_date'] if any(col in columns_to_drop for col in data.columns): data.drop(columns_to_drop, axis=1, inplace=True) # Step 5: Fill missing values in 'Rating' column with median data['Rating'].fillna(data['Rating'].median(), inplace=True) # Step 6: Fill missing values in categorical features data.fillna({'Genre': 'Unknown', 'Director': 'Unknown', 'Actor 1': 'Unknown', 'Actor 2': 'Unknown', 'Actor 3': 'Unknown'}, inplace=True) # Step 7: Display Scatter plot with hue based on 'Genre' plt.figure(figsize=(12, 8)) sns.scatterplot(data=data, x='Genre', y='Rating', hue='Genre') plt.title('Scatter plot of Rating vs Genre') plt.xlabel('Genre') plt.ylabel('Rating') plt.xticks(rotation=45) plt.show() # Step 8: Display Box plot with 'Genre' on y-axis and 'Rating' on x-axis plt.figure(figsize=(12, 8)) sns.boxplot(data=data, y='Genre', x='Rating', orient='h') plt.title('Box plot of Rating across different Genres') plt.xlabel('Rating') plt.ylabel('Genre') plt.show() # Step 9: Separate features and target variable X = data.drop('Rating', axis=1) y = data['Rating'] # Step 10: Preprocessing steps numeric_transformer = StandardScaler() categorical_transformer = OneHotEncoder(handle_unknown='ignore') preprocessor = ColumnTransformer(transformers=[('num', numeric_transformer, ['Year', 'Duration', 'Votes']), ('cat', categorical_transformer, ['Genre', 'Director', 'Actor 1', 'Actor 2', 'Actor 3'])]) # Step 11: 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) # Step 12: Return datasets and preprocessor return X_train, X_test, y_train, y_test, preprocessor # Step 13: Example usage result = load_and_preprocess_data('IMDb Movies India.csv') if result[0] is not None: X_train, X_test, y_train, y_test, preprocessor = result print("Data loaded and preprocessed successfully!") Column names in the dataset: Index(['Name', 'Year', 'Duration', 'Genre', 'Rating', 'Votes', 'Director', 'Actor 1', 'Actor 2', 'Actor 3'], dtype='object') Scatter plot of Rating vs Genre Genre 10 Drama Drama, Musical Comedy, Romance Comedy, Drama, Musical Drama, Romance, War Documentary 8 Horror, Mystery, Thriller Action, Crime, Thriller Horror Horror, Romance, Thriller Comedy, Drama, Romance Thriller Rating Comedy, Drama Unknown Comedy, Drama, Fantasy Comedy, Drama, Family Crime, Drama, Mystery Horror, Thriller Biography Comedy, Horror Action Drama, Horror, Mystery Comedy Action, Thriller 2 Drama, History Drama, History, Sport Horror, Mystery, Romance Horror, Mystery Drama, Horror, Romance Action, Drama, History Action, Drama, War Comedy, Family Adventure, Horror, Mystery Action, Sci-Fi Crime, Mystery, Thriller War Genre Biography, Drama, History Horror, Romance Crime, Drama Drama, Romance Adventure, Drama Comedy, Mystery, Thriller Action, Crime, Drama Crime, Thriller Horror, Sci-Fi, Thriller Crime, Drama, Thriller Drama, Mystery, Thriller Drama, Sport Drama, Family, Musical Action, Comedy Comedy, Thriller Action, Adventure, Fantasy Drama, Romance, Thriller Action, Drama Drama, Horror, Musical Action, Biography, Drama Adventure, Comedy, Drama Mystery Action, Fantasy, Mystery Adventure, Drama, Mystery Mystery, Thriller Adventure Drama, Musical, Thriller Comedy, Crime, Drama Musical, Romance Documentary, Music Documentary, History, Music Drama, Fantasy, Mystery Drama, Family, Sport Drama, Thriller Documentary, Biography Action, Adventure, Comedy Romance Comedy, Drama, Music Comedy, Horror, Mystery Musical Musical, Romance, Drama Family, Romance Action, Sci-Fi, Thriller Action, Drama, Romance Mystery, Romance Fantasy Family Drama, Family Action, Comedy, Drama Action, Drama, Thriller Drama, Horror, Thriller Drama, Musical, Romance Comedy, Sci-Fi Action, Romance Action, Crime Action, Drama, Crime Drama, Family, Music Action, Mystery, Thriller Action, Drama, Family Action, Mystery Drama, History, Romance Crime, Drama, Music Sci-Fi Animation Crime, Mystery, Romance Action, Adventure, Romance Music, Romance Action, Comedy, Crime Comedy, Family, Fantasy Romance, Drama Drama, Family, Romance Romance, Drama, Family Musical, Romance, Thriller Family, Musical, Romance Action, Drama, Fantasy Family, Drama Crime, Drama, Romance Musical, Drama, Romance Drama, Music, Musical Drama, Mystery Adventure, Comedy, Romance Crime, Drama, Horror Family, Music, Musical Action, Musical, Thriller Action, Romance, Thriller Romance, Thriller Drama, Music Crime, Drama, Musical Action, Crime, Mystery Action, Adventure, Thriller Comedy, Romance, Sci-Fi Crime Action, Drama, Mystery Action, Comedy, Thriller Biography, Drama Action, Comedy, Fantasy Drama, Family, Horror Action, Adventure, Family Documentary, Biography, Musical Action, Drama, Musical Adventure, Thriller Crime, Mystery Drama, Crime Drama, Fantasy, Romance Comedy, Romance, Thriller Musical, Comedy, Drama Biography, History, War Action, Comedy, Romance Drama, History, Musical Action, Crime, Horror Adventure, Fantasy Adventure, Drama, Fantasy Adventure, Fantasy, Romance Action, Adventure, Drama Action, Adventure Comedy, Crime Crime, Drama, Fantasy Adventure, Drama, Romance History Drama, Fantasy, Thriller Musical, Fantasy Documentary, Thriller Mystery, Romance, Musical Family, Drama, Romance History, Musical, Romance Musical, Drama, Crime Adventure, Crime, Romance Musical, Thriller, Mystery Drama, Comedy Biography, Drama, Romance Biography, Music Biography, Drama, Music Drama, Sci-Fi Drama, Family, Thriller Comedy, Musical, Romance Drama, Family, Comedy Action, Thriller, Romance Animation, Adventure Action, Crime, Musical Action, Crime, Romance Animation, Action, Adventure Action, Drama, Sport Comedy, History Documentary, History Drama, Comedy, Family Action, Adventure, Crime Documentary, Biography, Music Comedy, Musical Biography, Crime, Thriller Adventure, Mystery, Thriller Biography, Drama, Sport Action, Comedy, Musical Mystery, Romance, Thriller Action, Adventure, Musical Crime, Musical, Mystery Action, Thriller, Crime Adventure, Comedy, Crime Comedy, Horror, Musical Adventure, Family Family, Thriller Drama, Action, Crime Drama, War Action, Drama, Adventure Adventure, Fantasy, History Fantasy, Musical Comedy, Drama, Thriller Drama, Fantasy Musical, Drama Action, Drama, Horror Biography, Crime, Drama Action, Drama, Music Adventure, Drama, Family Drama, Romance, Musical Comedy, Musical, Drama Adventure, Comedy, Musical Crime, Drama, Family Thriller, Musical, Mystery Documentary, Adventure, Crime Drama, Action, Horror Adventure, Crime, Drama Documentary, Biography, Sport Crime, Fantasy, Mystery Documentary, Biography, Drama Action, Fantasy, Thriller Adventure, Drama, History Animation, Drama, History Comedy, Horror, Thriller Drama, Family, History Animation, History Biography, Drama, Musical Music Family, Comedy Adventure, Mystery Family, Fantasy Documentary, History, News Drama, Mystery, Romance Comedy, Fantasy Action, Crime, Family Drama, Musical, Mystery Action, Thriller, Mystery Drama, Family, Fantasy Action, Family Action, Adventure, Mystery Horror, Fantasy Comedy, Action Adventure, Romance Drama, Adventure Animation, Drama, Romance Comedy, Crime, Romance Adventure, Comedy Comedy, Drama, Sport Documentary, Crime, History Musical, Mystery, Drama Adventure, Drama, Sci-Fi Action, Romance, Western Comedy, Fantasy, Romance Animation, Action, Comedy Drama, Fantasy, Sci-Fi Drama, Horror Family, Drama, Comedy Action, Adventure, History Comedy, Family, Romance Biography, History Animation, Family Drama, Fantasy, History Animation, Adventure, Fantasy Adventure, Comedy, Family Drama, History, War Animation, Drama, Fantasy Action, Musical, Romance Crime, Action, Drama Comedy, Romance, Musical Fantasy, Drama Musical, Action, Crime Documentary, Drama Action, Horror, Thriller Action, Horror, Sci-Fi Mystery, Sci-Fi, Thriller Biography, Family Drama, Action, Comedy Drama, Music, Romance Action, Biography, Crime Adventure, Drama, Musical Family, Music, Romance Fantasy, Mystery, Romance Drama, Crime, Family Drama, Family, Action Romance, Comedy, Drama Animation, Adventure, Comedy Sci-Fi, Thriller Romance, Family, Drama Action, Family, Thriller Adventure, Crime, Thriller Drama, Romance, Sport Comedy, Crime, Mystery Adventure, Comedy, Mystery Action, Fantasy Comedy, Mystery Animation, Adventure, Family Adventure, Drama, Music Biography, Drama, War Documentary, Comedy, Drama Musical, Drama, Family Animation, Comedy, Drama Fantasy, Musical, Drama Adventure, Crime, Mystery Comedy, Drama, Mystery Documentary, News Drama, Musical, Family Action, Romance, Drama Comedy, Crime, Thriller Action, Musical Action, History Action, Comedy, Mystery Drama, Family, Mystery Adventure, Drama, Thriller Documentary, Reality-TV Action, Fantasy, Horror Drama, History, Thriller Documentary, Family Documentary, Biography, Family Comedy, Sport Animation, Comedy, Family Crime, Romance, Thriller Comedy, Musical, Action Action, Mystery, Sci-Fi Comedy, Crime, Musical Drama, Adventure, Action History, Romance Reality-TV Fantasy, History Family, Drama, Thriller Musical, Mystery, Thriller Musical, Comedy, Romance Musical, Action, Drama Action, Musical, War Romance, Comedy Horror, Crime, Thriller Crime, Drama, History Comedy, Drama, Horror Crime, Horror, Thriller Animation, Comedy Romance, Action, Crime Musical, Thriller Action, Romance, Comedy Comedy, Family, Musical Horror, Drama, Mystery Thriller, Mystery, Family Comedy, Drama, Sci-Fi Documentary, Adventure Documentary, Biography, Crime Musical, Action Musical, Mystery Action, Crime, Sci-Fi Action, Horror, Mystery Fantasy, Horror Adventure, Family, Fantasy Fantasy, Sci-Fi Comedy, War Romance, Action, Drama Musical, Family, Romance Romance, Drama, Action Family, Comedy, Drama Comedy, Music, Romance Comedy, Family, Sci-Fi Action, Drama, Western Adventure, Romance, Thriller Biography, Comedy, Drama Action, Mystery, Romance Romance, Sport Crime, Romance Action, Thriller, Western Crime, Musical, Romance Romance, Thriller, Mystery Drama, Crime, Mystery Biography, Drama, Family Action, Family, Mystery Comedy, Mystery, Romance Drama, Thriller, Action Documentary, Short Documentary, Western Musical, Family, Drama Action, Family, Musical Animation, Family, Musical Drama, Fantasy, Horror Action, Adventure, Sci-Fi Drama, Action, Musical Drama, Musical, Sport Action, Comedy, Horror Drama, Fantasy, Musical Action, Fantasy, Musical Animation, Action Comedy, Music Documentary, Drama, Romance Drama, Music, Thriller Fantasy, Musical, Mystery Drama, Fantasy, War Action, War Action, Adventure, War Horror, Musical Fantasy, Mystery, Thriller Adventure, Biography, Drama Family, Romance, Sci-Fi Drama, Romance, Family Animation, Adventure, Drama Family, Romance, Drama Animation, Action, Sci-Fi Adventure, Comedy, Fantasy Comedy, Crime, Family Horror, Musical, Thriller Biography, Drama, Thriller Drama, Western Romance, Sci-Fi, Thriller Comedy, Musical, Family Comedy, Horror, Romance Thriller, Action Fantasy, Thriller, Action Fantasy, Romance Action, Drama, Comedy Family, Fantasy, Romance Comedy, Crime, Horror Horror, Mystery, Sci-Fi Animation, Action, Drama Family, Mystery Adventure, Biography, History Fantasy, Horror, Mystery Family, Musical Drama, Family, Adventure Crime, Horror, Mystery Documentary, Drama, Fantasy Action, Adventure, Biography Biography, History, Thriller Action, Family, Drama Documentary, Drama, Sport Thriller, Mystery Musical, Drama, Comedy Documentary, History, War Adventure, Horror, Thriller Action, Adventure, Horror Action, Crime, War Adventure, Musical, Romance Action, Fantasy, Sci-Fi Drama, Comedy, Action Documentary, Sport Documentary, Adventure, Music Drama, Action, Family Adventure, History, Thriller Adventure, Horror, Romance Adventure, Crime, Horror Mystery, Musical, Romance Action, Crime, History Documentary, Musical Adventure, Fantasy, Musical Documentary, Family, History Documentary, Drama, Family Drama, Mystery, Sci-Fi Animation, Drama, Musical Drama, History, Mystery Drama, Sport, Thriller Action, Crime, Fantasy Comedy, Musical, Mystery Romance, Musical, Action Musical, Drama, Fantasy Animation, Family, History Action, Drama, News Romance, Musical, Comedy Adventure, Fantasy, Horror Adventure, History Comedy, Drama, History Mystery, Sci-Fi Action, Thriller, War Documentary, Drama, News Documentary, Crime, Mystery Adventure, Horror Animation, Drama, Adventure Crime, Horror, Romance Documentary, Adventure, Drama Documentary, Biography, History Fantasy, Horror, Romance Comedy, Fantasy, Musical Crime, Musical, Thriller Documentary, War Action, Comedy, War Crime, Drama, Sport Musical, Adventure, Drama Horror, Romance, Sci-Fi Musical, Mystery, Romance Romance, Musical, Drama Adventure, Fantasy, Sci-Fi Box plot of Rating across different Genres ----------2 10 Rating Data loaded and preprocessed successfully! **DOCMENATION** Load dataset: Data is loaded from the given file path. Check columns: Validates the presence of the 'Rating' column. Drop columns: Removes unnecessary columns like 'movie_id', 'title', and 'release_date'. Fill missing values: Imputes missing 'Rating' and categorical values. Display plots: Visualizes data distribution with scatter and box plots. Separate data: Divides the dataset into features (X) and target variable (y). Preprocessing: Applies scaling to numeric features and one-hot encoding to categorical features.

Split data: Splits the dataset into training and testing sets.