With Pipeline

In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
file_path=r'C:\Users\jagad\Downloads\Rotten_Tomatoes_Movies3.xls\Rotten_Tomatoes_Movie

# Load only necessary columns
columns_to_load = ['tomatometer_rating', 'runtime_in_minutes', 'audience_rating']  # R
data = pd.read_excel(file_path, usecols=columns_to_load)
data.head()
```

Out[1]:

	runtime_in_minutes	tomatometer_rating	audience_rating
0	83.0	49	53.0
1	90.0	86	64.0
2	118.0	68	53.0
3	95.0	100	97.0
4	127.0	89	74.0

In [2]:
```
data.isnull().sum()
```

Out[2]:
```
runtime_in_minutes    155
tomatometer_rating      0
audience_rating       252
dtype: int64
```

In [3]:
```
data.fillna(method='ffill', inplace=True)
data.isnull().sum()
```

Out[3]:
```
runtime_in_minutes    0
tomatometer_rating    0
audience_rating       0
dtype: int64
```

In [4]:
```
data.dtypes
```

Out[4]:
```
runtime_in_minutes    float64
tomatometer_rating      int64
audience_rating       float64
dtype: object
```

In [5]:
```
X = data.drop('audience_rating', axis=1)
y = data['audience_rating']
print(X.shape, y.shape)
```

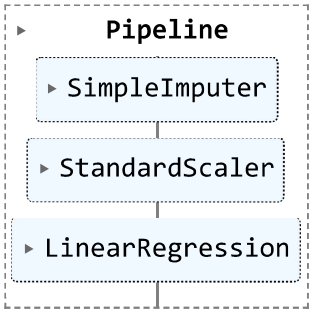
```
(16638, 2) (16638,)
```

In [6]:
```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=
```

In [7]:
```
from sklearn.pipeline import Pipeline
from sklearn.preprocessing import StandardScaler, FunctionTransformer
from sklearn.linear_model import LinearRegression
from sklearn.impute import SimpleImputer
```

In [8]:
```
# Creating a pipeline for preprocessing and model training
pipeline = Pipeline(steps=[
    ('imputer', SimpleImputer(strategy='mean')),  # Impute missing values
    ('scaler', StandardScaler()),  # Scale features
    ('model', LinearRegression())  # Linear regression model
])
pipeline.fit(X_train, y_train)
```

Out[8]:



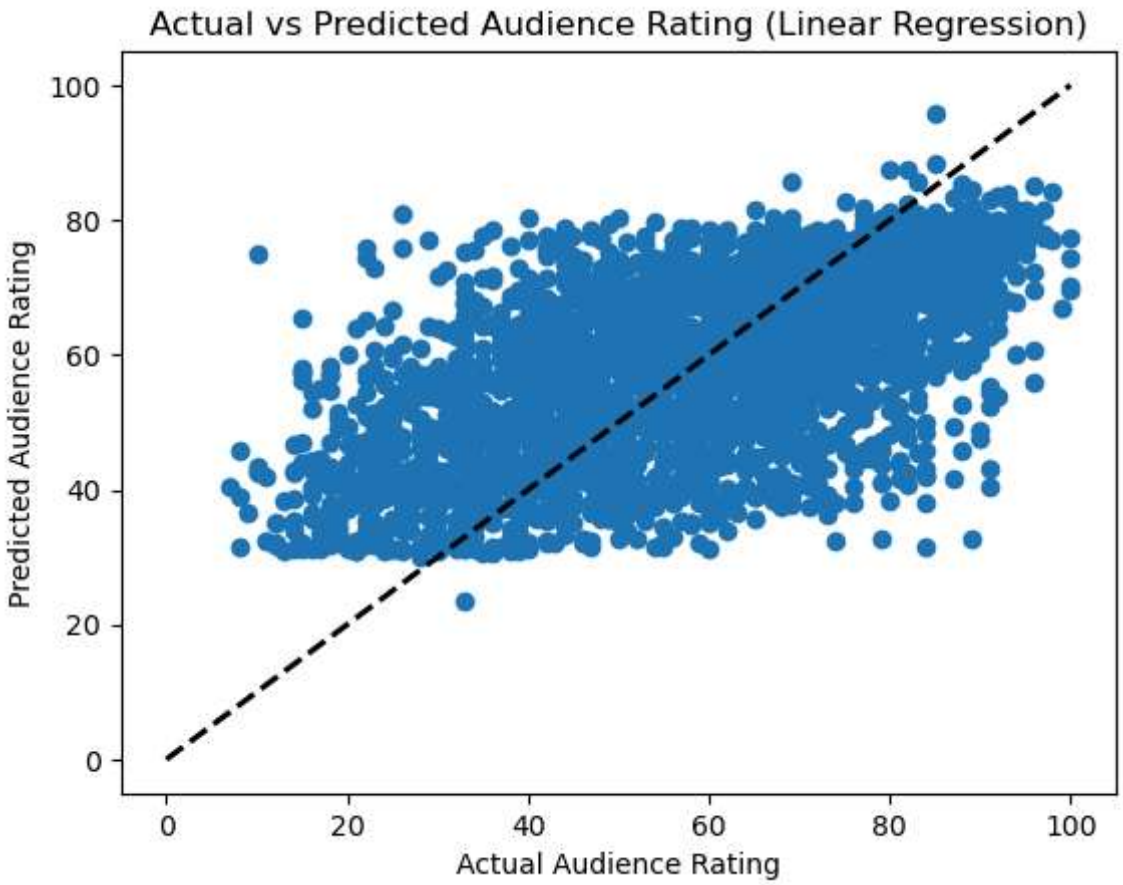
In [9]:
```
# predictions
y_pred = pipeline.predict(X_test)
y_pred
```

Out[9]:
```
array([54.25862297, 52.98514645, 66.26488028, ..., 69.05244811,
       71.27042093, 63.94427316])
```

In [10]:
```
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

# Calculate evaluation metrics
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print(f'Mean Absolute Error: {mae}')
print(f'Mean Squared Error: {mse}')
print(f'R-squared: {r2}')
```

```
Mean Absolute Error: 12.287456776541545
Mean Squared Error: 236.75948249683958
R-squared: 0.4302708363756904
```

In [11]:
```
# Visualize the results

plt.scatter(y_test, y_pred)
plt.xlabel('Actual Audience Rating')
plt.ylabel('Predicted Audience Rating')
plt.title('Actual vs Predicted Audience Rating (Linear Regression)')
plt.plot([y.min(), y.max()], [y.min(), y.max()], 'k--', lw=2)  # Diagonal line
plt.show()
```



without pipeline

In [12]:
```
import pandas as pd
import matplotlib.pyplot as plt
file_path=r'C:\Users\jagad\Downloads\Rotten_Tomatoes_Movies3.xls\Rotten_Tomatoes_Movie

# Load only necessary columns
columns_to_load = ['tomatometer_rating', 'runtime_in_minutes', 'audience_rating']  # R
data = pd.read_excel(file_path, usecols=columns_to_load)
data.head()
```

Out[12]:

	runtime_in_minutes	tomatometer_rating	audience_rating
0	83.0	49	53.0
1	90.0	86	64.0
2	118.0	68	53.0
3	95.0	100	97.0
4	127.0	89	74.0

In [13]:
```
data.fillna(method='ffill', inplace=True)
data.isnull().sum()
```

Out[13]:
```
runtime_in_minutes    0
tomatometer_rating    0
audience_rating       0
dtype: int64
```

In [14]:
```
X = data.drop('audience_rating', axis=1)
y = data['audience_rating']
print(X.shape, y.shape)
```

```
(16638, 2) (16638,)
```

In [15]:
```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=
```

In [16]:
```
from sklearn.linear_model import LinearRegression

# Initialize the model
model = LinearRegression()

# Fitting the model
model.fit(X_train, y_train)
```

Out[16]:
```
▾ LinearRegression

LinearRegression()
```

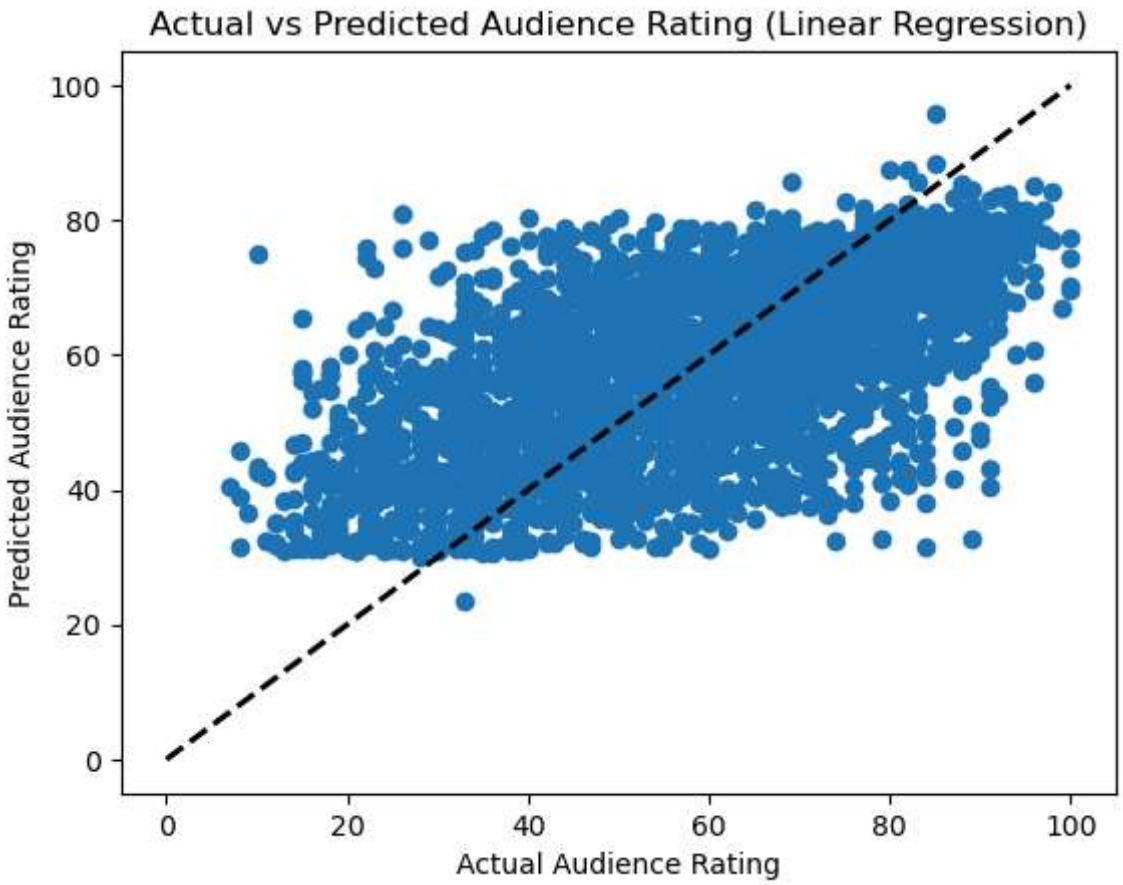
In [17]:
```
# predictions
y_pred = model.predict(X_test)
y_pred
```

Out[17]:
```
array([54.25862297, 52.98514645, 66.26488028, ..., 69.05244811,
       71.27042093, 63.94427316])
```

In [18]:
```
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

# Calculate evaluation metrics
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print(f'Mean Absolute Error: {mae}')
print(f'Mean Squared Error: {mse}')
print(f'R-squared: {r2}')
```

```
Mean Absolute Error: 12.287456776541545
Mean Squared Error: 236.75948249683958
R-squared: 0.4302708363756904
```

In [19]:
```
import matplotlib.pyplot as plt

plt.scatter(y_test, y_pred)
plt.xlabel('Actual Audience Rating')
plt.ylabel('Predicted Audience Rating')
plt.title('Actual vs Predicted Audience Rating (Linear Regression)')
plt.plot([y.min(), y.max()], [y.min(), y.max()], 'k--', lw=2)  # Diagonal line
plt.show()
```


Actual vs Predicted Audience Rating (Linear Regression)
Predicted Audience Rating
Actual Audience Rating
0
20
40
60
80
100

In [ ]: