```
import pandas as pd

df = pd.read_csv("/content/HR-Employee-Attrition (1).csv")


# Remove null values
df_cleaned = df.dropna()

# Remove duplicate rows
df_cleaned = df_cleaned.drop_duplicates()

# Display the cleaned DataFrame
print("\nDataFrame after removing null values and duplicates:")
print(df_cleaned)
```

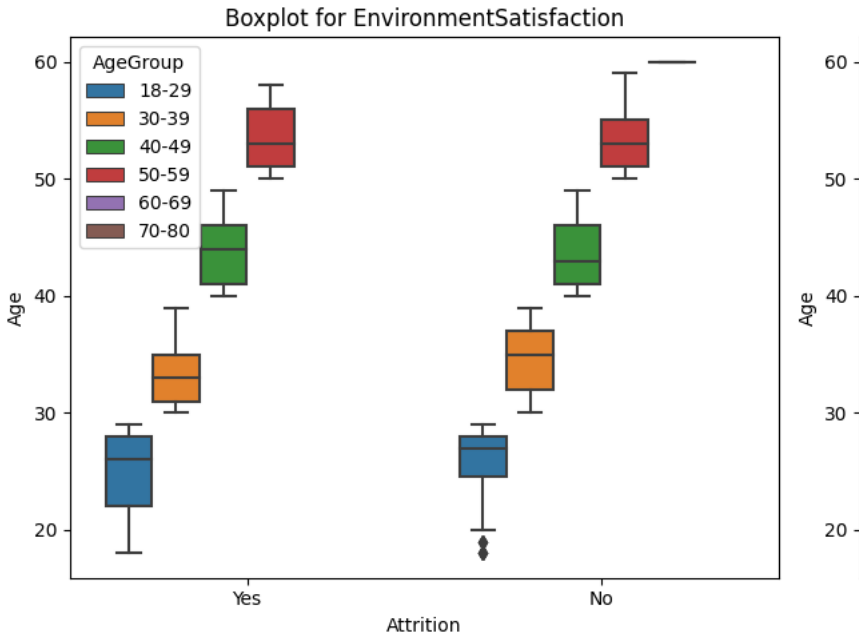
```
DataFrame after removing null values and duplicates:
      Age Attrition     BusinessTravel  DailyRate              Department  \
0      41       Yes      Travel_Rarely       1102                   Sales
1      49        No  Travel_Frequently        279  Research & Development
2      37       Yes      Travel_Rarely       1373  Research & Development
3      33        No  Travel_Frequently       1392  Research & Development
4      27        No      Travel_Rarely        591  Research & Development
...   ...       ...                ...        ...                     ...
1465   36        No  Travel_Frequently        884  Research & Development
1466   39        No      Travel_Rarely        613  Research & Development
1467   27        No      Travel_Rarely        155  Research & Development
1468   49        No  Travel_Frequently       1023                   Sales
1469   34        No      Travel_Rarely        628  Research & Development

      DistanceFromHome  Education EducationField  EmployeeCount  \
0                    1          2  Life Sciences              1
1                    8          1  Life Sciences              1
2                    2          2          Other              1
3                    3          4  Life Sciences              1
4                    2          1        Medical              1
...                ...        ...            ...            ...
1465                23          2        Medical              1
1466                 6          1        Medical              1
1467                 4          3  Life Sciences              1
1468                 2          3        Medical              1
1469                 8          3        Medical              1

      EmployeeNumber  ...  RelationshipSatisfaction StandardHours  \
0                  1  ...                         1            80
1                  2  ...                         4            80
2                  4  ...                         2            80
3                  5  ...                         3            80
4                  7  ...                         4            80
...              ...  ...                       ...           ...
1465            2061  ...                         3            80
1466            2062  ...                         1            80
1467            2064  ...                         2            80
1468            2065  ...                         4            80
1469            2068  ...                         1            80

      StockOptionLevel  TotalWorkingYears  TrainingTimesLastYear  \
0                    0                  8                      0
1                    1                 10                      3
2                    0                  7                      3
3                    0                  8                      3
4                    1                  6                      3
...                ...                ...                    ...
1465                 1                 17                      3
1466                 1                  9                      5
1467                 1                  6                      0
1468                 0                 17                      3
1469                 0                  6                      3

     WorkLifeBalance  YearsAtCompany YearsInCurrentRole  \
0                  1               6                  4
1                  3              10                  7
2                  3               0                  0
```

```
import pandas as pd
df = pd.read_csv('/content/HR-Employee-Attrition (1).csv')
df['Attrition'] = df['Attrition'].map({'Yes': 1, 'No': 0})
print(df['Attrition'])
result_department = df.groupby('Department')['Attrition'].mean()
result_gender = df.groupby('Gender')['Attrition'].mean()
print("Mean Attrition by Department:")
print(result_department)

print("\nMean Attrition by Gender:")
print(result_gender)
```

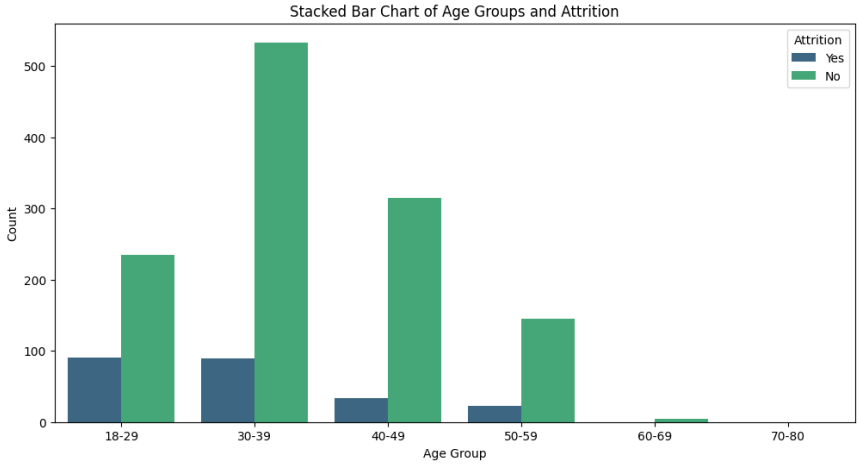
```
percentage_attrition = len(df[df['Attrition'] == 1]) / len(df) * 100
print(f"\nPercentage of Attrition: {percentage_attrition:.2f}%")
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
<ipython-input-23-ff41b0f8f38d> in <cell line: 2>()
      1 import pandas as pd
----> 2 df = pd.read_csv('/content/HR-Employee-Attrition (1).csv')
      3 df['Attrition'] = df['Attrition'].map({'Yes': 1, 'No': 0})
      4 print(df['Attrition'])
      5 result_department = df.groupby('Department')['Attrition'].mean()

                                 6 frames
/usr/local/lib/python3.10/dist-packages/pandas/io/common.py in
get_handle(path_or_buf, mode, encoding, compression, memory_map, is_text, errors,
storage_options)
    854         if ioargs.encoding and "b" not in ioargs.mode:
    855             # Encoding
--> 856             handle = open(
    857                 handle,
    858                 ioargs.mode,

FileNotFoundError: [Errno 2] No such file or directory: '/content/HR-Employee-
Attrition (1).csv'
```

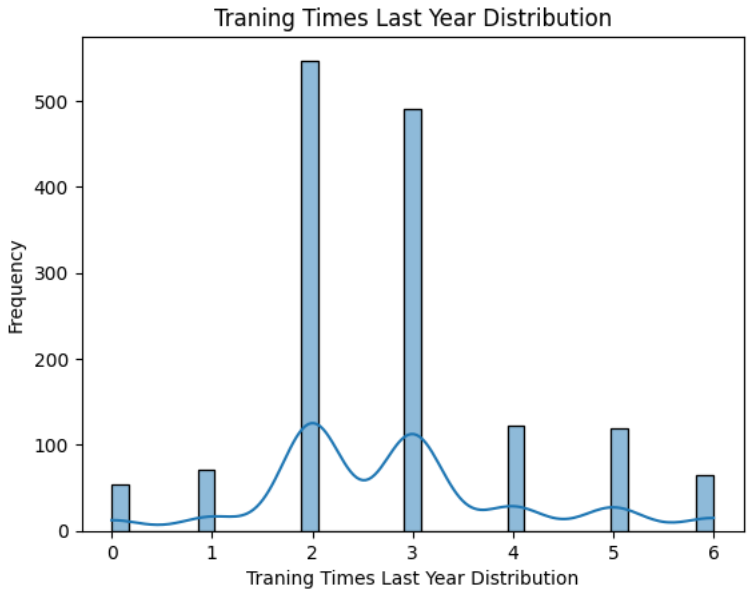
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df = pd.read_csv("/content/HR-Employee-Attrition (1).csv")


age_bins = [18, 30, 40, 50, 60, 70, 80]
age_labels = ['18-29', '30-39', '40-49', '50-59', '60-69', '70-80']


df['AgeGroup'] = pd.cut(df['Age'], bins=age_bins, labels=age_labels, right=False)
categorical_values = ['EnvironmentSatisfaction', 'JobSatisfaction']
fig, axes = plt.subplots(nrows=1, ncols=2, figsize=(12, 10)
for i, var in enumerate(categorical_values):
    sns.boxplot(x='Attrition', y='Age', hue='AgeGroup', data=df, ax=axes[i])
    axes[i].set_title(f'Boxplot for {var}')

plt.tight_layout()
plt.show()
```



```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df = pd.read_csv("/content/HR-Employee-Attrition (1).csv")


age_bins = [18, 30, 40, 50, 60, 70, 80]
age_labels = ['18-29', '30-39', '40-49', '50-59', '60-69', '70-80']

df['AgeGroup'] = pd.cut(df['Age'], bins=age_bins, labels=age_labels, right=Fals
plt.figure(figsize=(12, 6))
sns.countplot(x='AgeGroup', hue='Attrition', data=df, palette='viridis')
plt.title('Stacked Bar Chart of Age Groups and Attrition')
plt.xlabel('Age Group')
plt.ylabel('Count')
plt.legend(title='Attrition', loc='upper right')
plt.show()
```




```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
df=pd.read_csv('/content/HR-Employee-Attrition (1).csv')
sns.histplot(df['TrainingTimesLastYear'],kde=True)
plt.xlabel('Traning Times Last Year Distribution')
plt.ylabel('Frequency')
plt.title('Traning Times Last Year Distribution')
plt.show()
```




```
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import seaborn as sns
import matplotlib.pyplot as plt
```
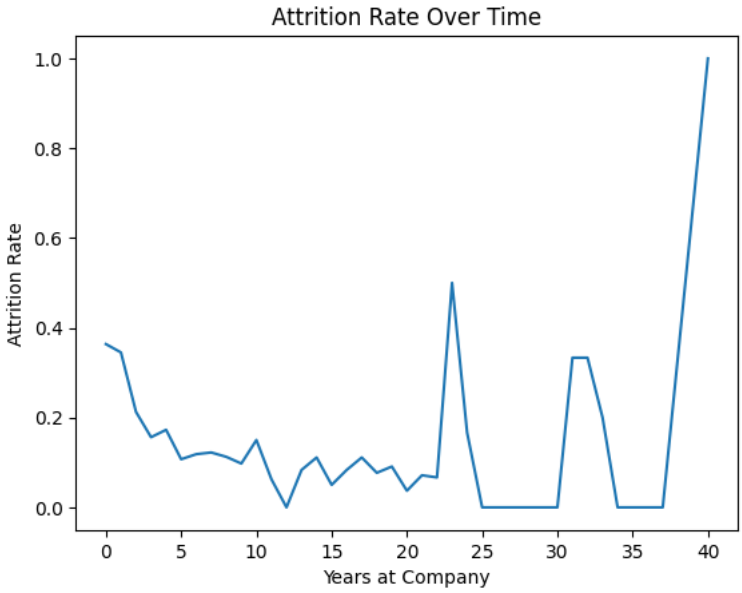
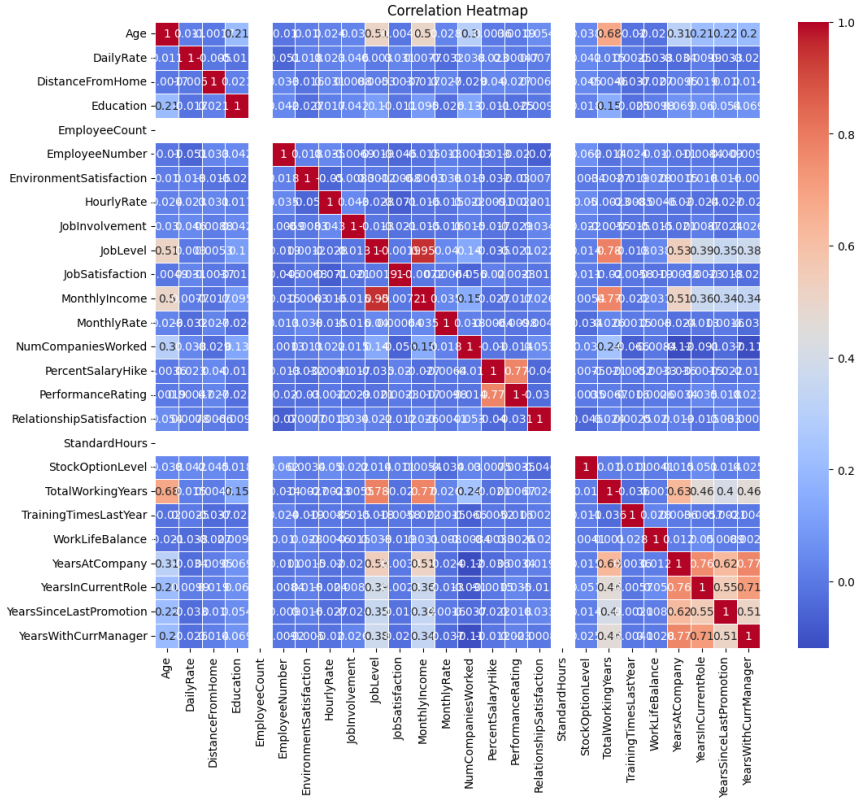

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df = pd.read_csv('/content/HR-Employee-Attrition (1).csv')
```

```
df['Attrition_binary'] = df['Attrition'].map({'Yes': 1, 'No': 0}
attrition_data = df.groupby('YearsAtCompany')['Attrition_binary'].mean().reset_index
sns.lineplot(x='YearsAtCompany', y='Attrition_binary', data=attrition_data)
plt.xlabel('Years at Company')
plt.ylabel('Attrition Rate')
plt.title('Attrition Rate Over Time')
plt.show()
```



```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df = pd.read_csv('/content/HR-Employee-Attrition (1).csv')

corr_matrix = df.corr()

plt.figure(figsize=(12, 10))
sns.heatmap(corr_matrix, annot=True, cmap='coolwarm', linewidths=.5)
plt.title("Correlation Heatmap")
plt.show()
```

```
<ipython-input-28-0fcf11c1b79c>:7: FutureWarning: The default value of numeric_only :
  corr_matrix = df.corr()
```




```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_squared_error
import matplotlib.pyplot as plt
data = pd.read_csv('/content/HR-Employee-Attrition.csv')


categorical_cols = [ 'JobSatisfaction']
data = pd.get_dummies(data, columns=categorical_cols)
```

```
X = data.drop('PerformanceRating', axis=1)
y = data['PerformanceRating']


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

model = RandomForestRegressor(n_estimators=100, random_state=42)
model.fit(X_train, y_train)

y_pred = model.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
print(f"Mean Squared Error: {mse}")

feature_importances = model.feature_importances_
plt.barh(X.columns, feature_importances)
plt.xlabel("Feature Importance")
plt.ylabel("Feature")
plt.show()
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-19-d52e8da8b8f2> in <cell line: 20>()
     18
     19 model = RandomForestRegressor(n_estimators=100, random_state=42)
---> 20 model.fit(X_train, y_train)
```