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

data = pd.read_csv('heart.csv')

data.head()
```

```
   age  sex  cp  trestbps  chol  fbs  restecg  thalach  exang  oldpeak
slope  \
0   52    1   0       125   212    0        1      168      0      1.0
2
1   53    1   0       140   203    1        0      155      1      3.1
0
2   70    1   0       145   174    0        1      125      1      2.6
0
3   61    1   0       148   203    0        1      161      0      0.0
2
4   62    0   0       138   294    1        1      106      0      1.9
1

   ca  thal  target
0   2     3       0
1   0     3       0
2   0     3       0
3   1     3       0
4   3     2       0
```
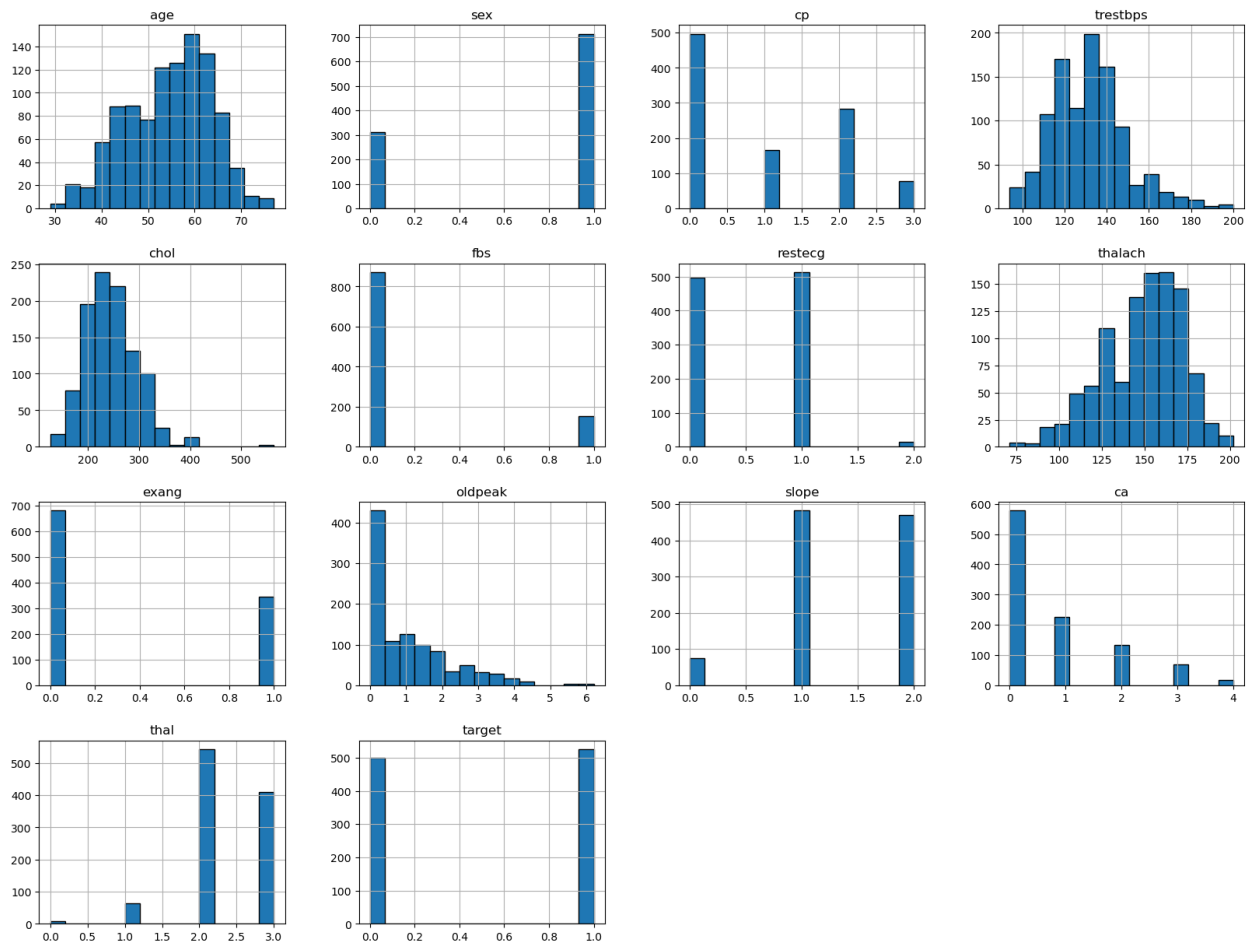
```python
# a. Histograms (Objective: Analyze the distribution of numerical
features)
data.hist(bins=15, figsize=(20, 15), edgecolor='black')
plt.suptitle('Histograms of Numerical Features', fontsize=20)
plt.show()
```

Histograms of Numerical Features


```python
plt.figure(figsize=(8, 5))
sns.histplot(data=data, x='age', bins=20, kde=True)
plt.title('Age Distribution')
plt.xlabel('Age')
plt.ylabel('Frequency')
plt.show()
```

Age Distribution
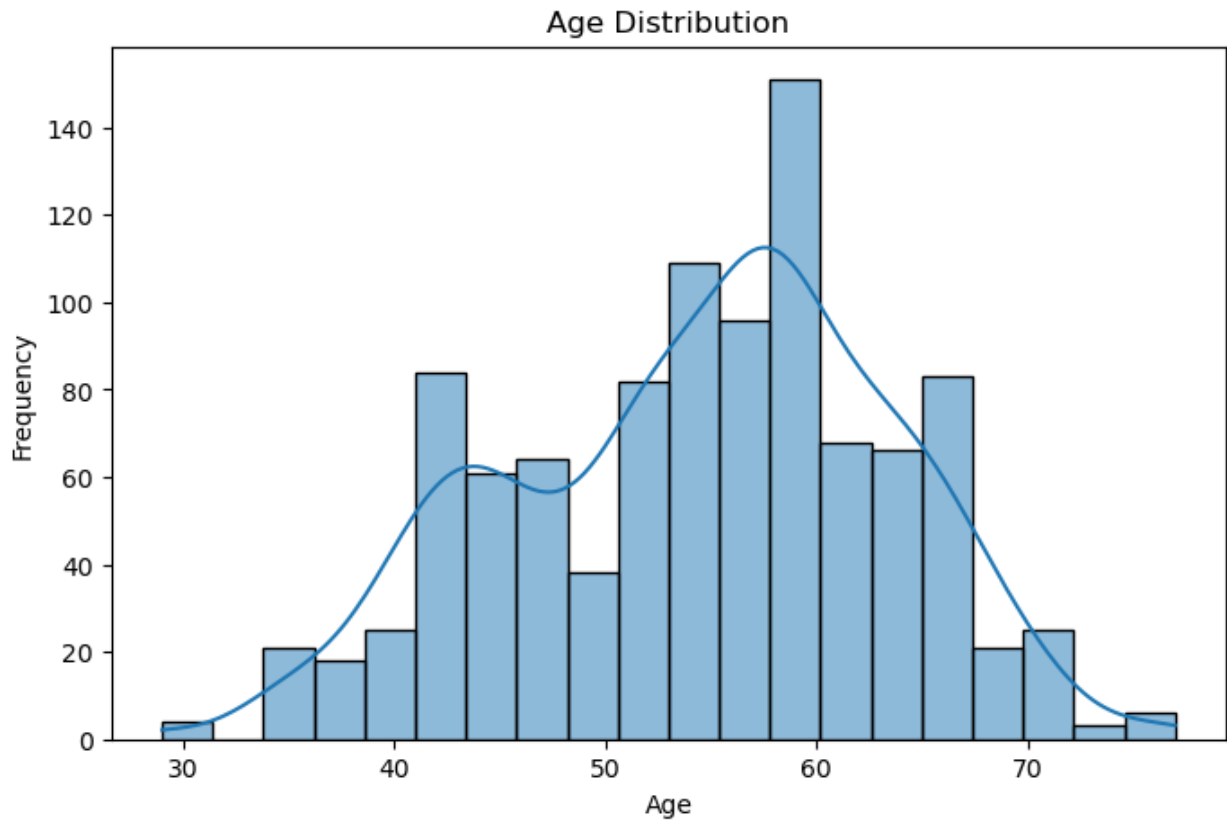

```python
# b. Dot Plots (Objective: Visualize individual data points for
features like 'age')
plt.figure(figsize=(10, 6))
sns.stripplot(data=data, x='target', y='age', jitter=True)

plt.title('Dot Plot: Age vs Target', fontsize=16)
plt.xlabel('target')
plt.ylabel('age')
plt.show()
```

Dot Plot: Age vs Target
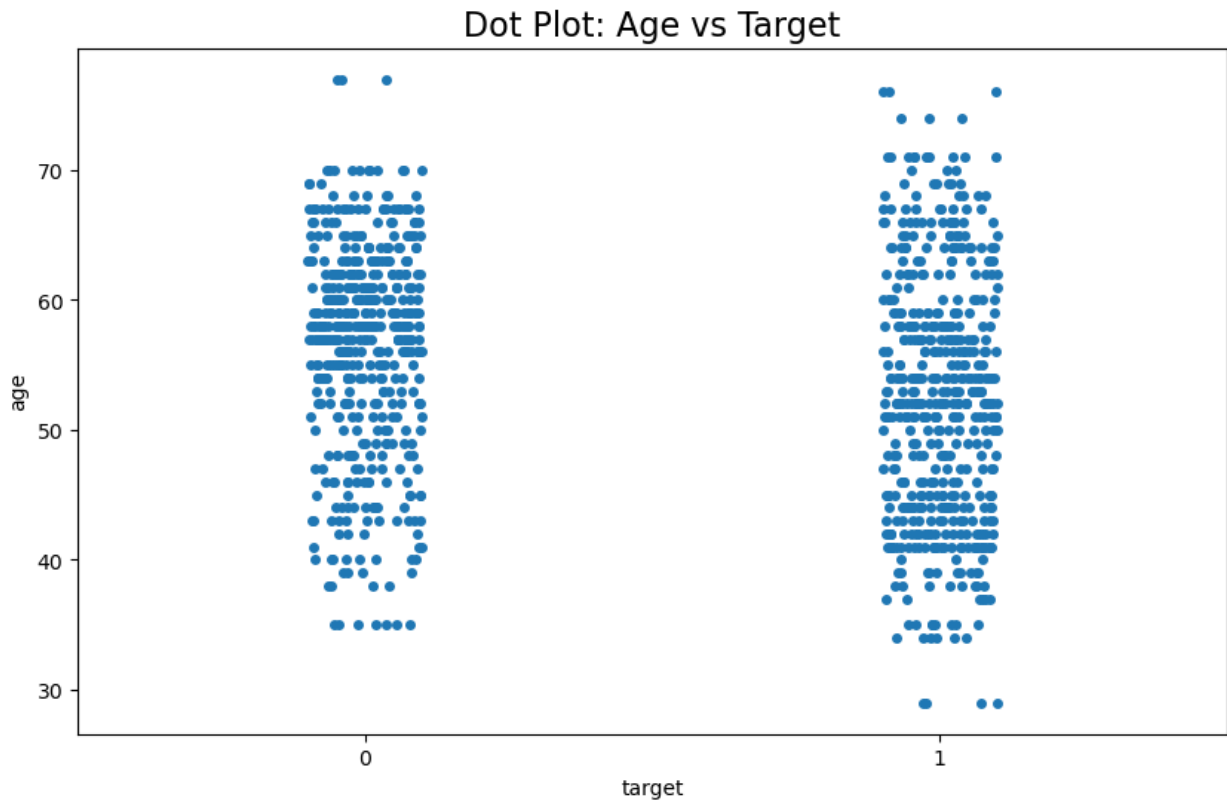
```
# c. Bar Plots (Objective: Compare counts of categorical variables
like 'sex')
sex_counts = data['sex'].value_counts()
sex_counts.plot(kind='bar', color=['skyblue', 'orange'], figsize=(8,
6))
plt.title('Bar Plot of Sex', fontsize=16)
plt.xlabel('Sex (0 = Female, 1 = Male)')
plt.ylabel('Count')
plt.show()
```

Bar Plot of Sex
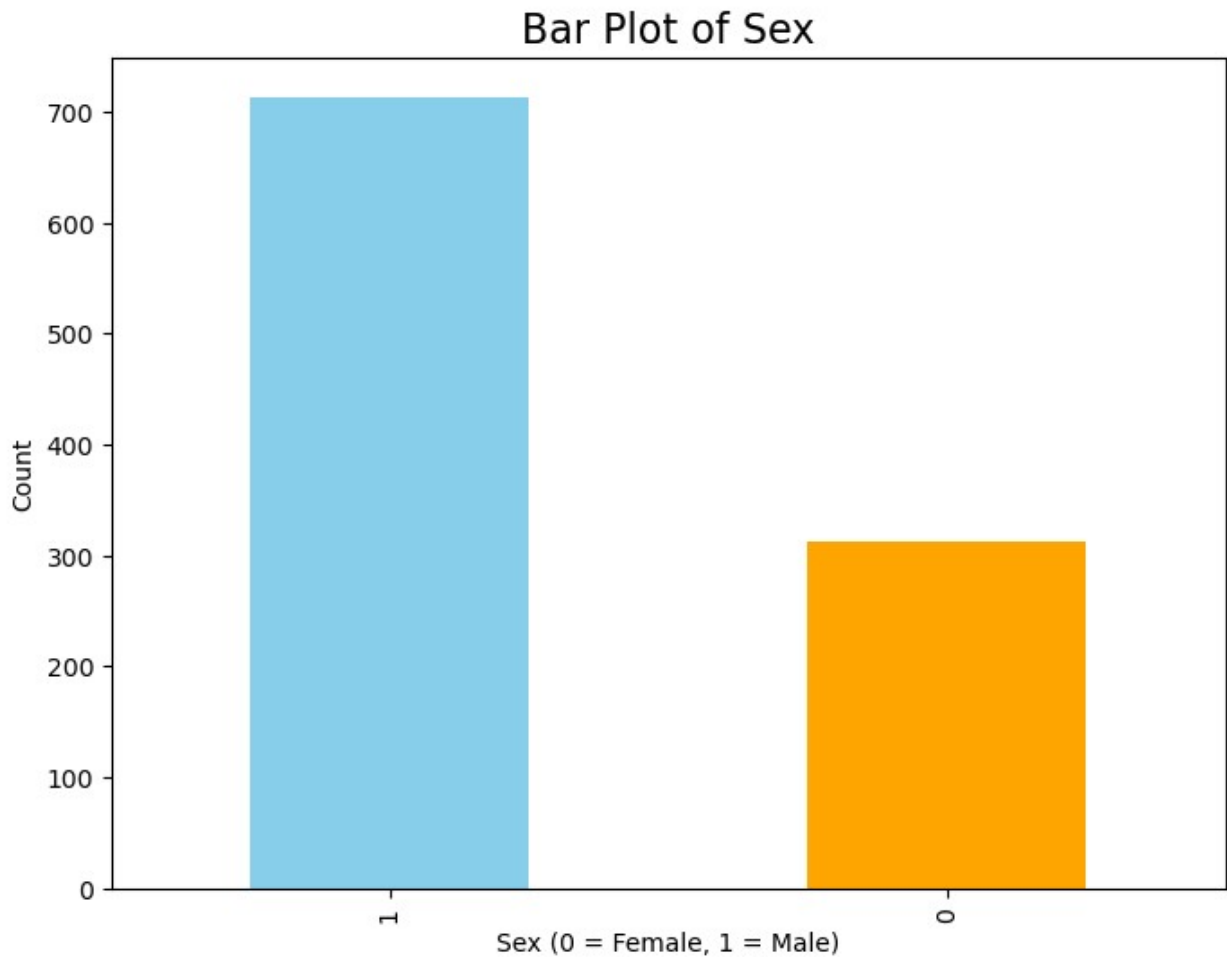

```python
# d. Line Charts (Objective: Observe trends, e.g., 'age' vs.
'thalach')
data.sort_values('age', inplace=True)
plt.figure(figsize=(10, 6))
plt.plot(data['age'], data['thalach'], color='purple', marker='o',
alpha=0.7)
plt.title('Line Chart: Age vs. Maximum Heart Rate', fontsize=16)
plt.xlabel('Age')
plt.ylabel('Maximum Heart Rate (thalach)')
plt.show()
```

Line Chart: Age vs. Maximum Heart Rate
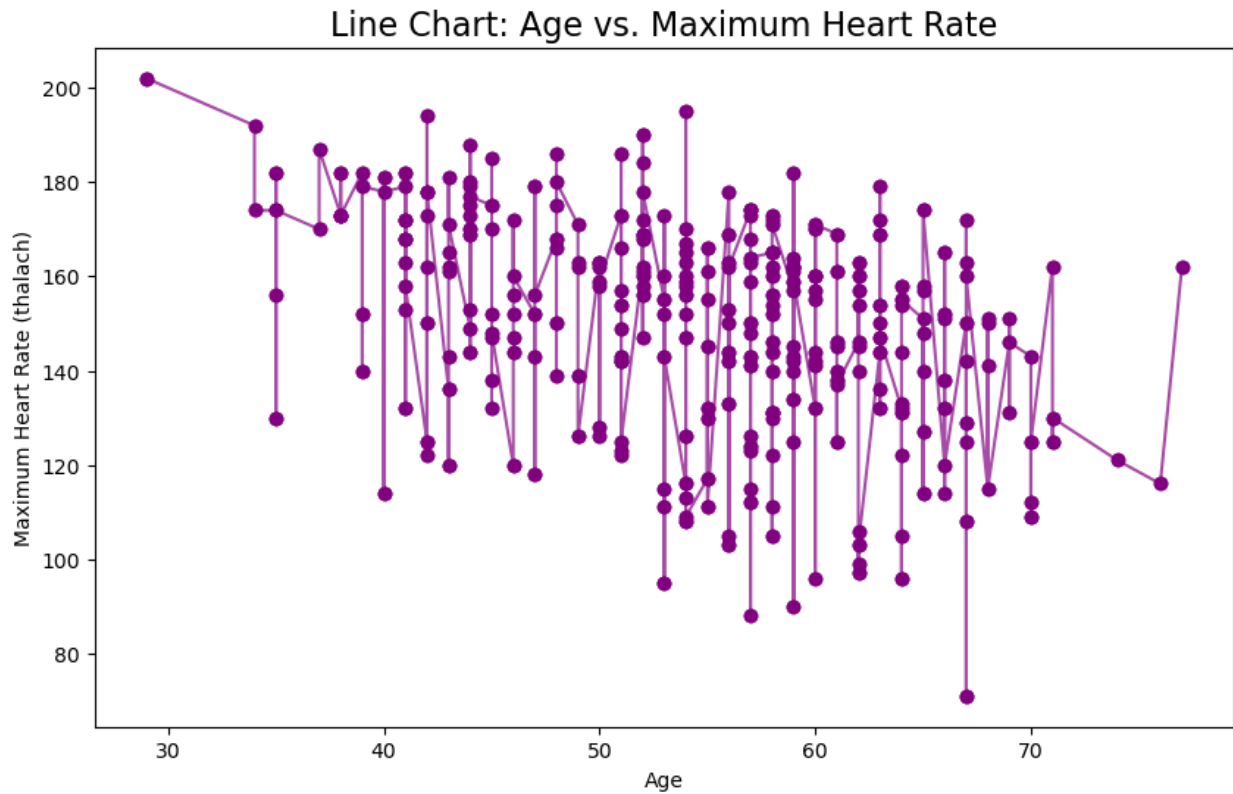
```
# Joint plot includes scatter, box, and histograms (Objective: Show
distribution and outliers)
sns.jointplot(data=data, x='age', y='chol', kind='scatter',
marginal_kws=dict(bins=15, fill=True))
plt.suptitle('Box/Scatter/Histogram Combination: Age vs Cholesterol',
y=1.02)
plt.show()
```

Box/Scatter/Histogram Combination: Age vs Cholesterol