```
from google.colab import drive
drive.mount('/content/drive/')
```

```
Mounted at /content/drive/
```

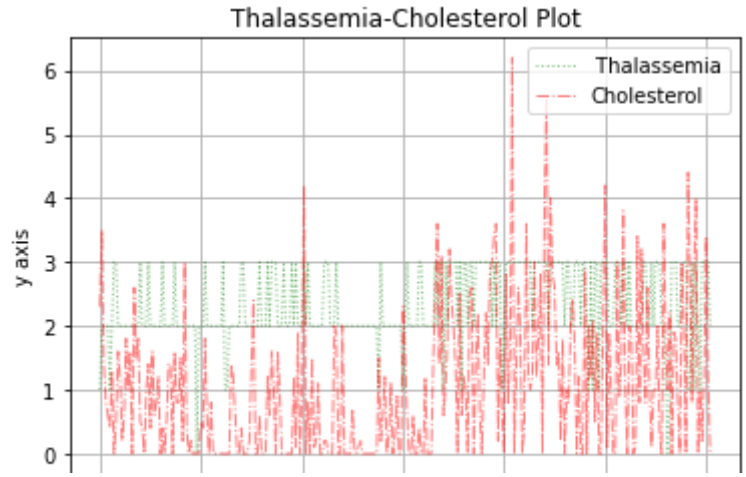
```
import pandas as pd
import os
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
df = pd.read_csv("/content/drive/My Drive/Colab Notebooks/heart.csv")
print(df.shape)
print(df.info())
```

```
(303, 14)
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 303 entries, 0 to 302
Data columns (total 14 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   age       303 non-null    int64  
 1   sex       303 non-null    int64  
 2   cp        303 non-null    int64  
 3   trestbps  303 non-null    int64  
 4   chol      303 non-null    int64  
 5   fbs       303 non-null    int64  
 6   restecg   303 non-null    int64  
 7   thalach   303 non-null    int64  
 8   exang     303 non-null    int64  
 9   oldpeak   303 non-null    float64
 10  slope     303 non-null    int64  
 11  ca        303 non-null    int64  
 12  thal      303 non-null    int64  
 13  target    303 non-null    int64  
dtypes: float64(1), int64(13)
```



```
# Line Plot
# color = color, label = label, linewidth = width of line, alpha = opacity
# grid = grid, linestyle = sytle of line

df.thal.plot(kind = 'line', color = 'g', label = ' Thalassemia',linewidth = 1, alpha = 0.5
df.oldpeak.plot(color = 'r',label = 'Cholesterol',linewidth = 1, alpha = 0.5, grid = True,
plt.legend(loc='upper right')
plt.xlabel('x axis')
plt.ylabel('y axis')
plt.title('Thalassemia-Cholesterol Plot')
plt.show()
```

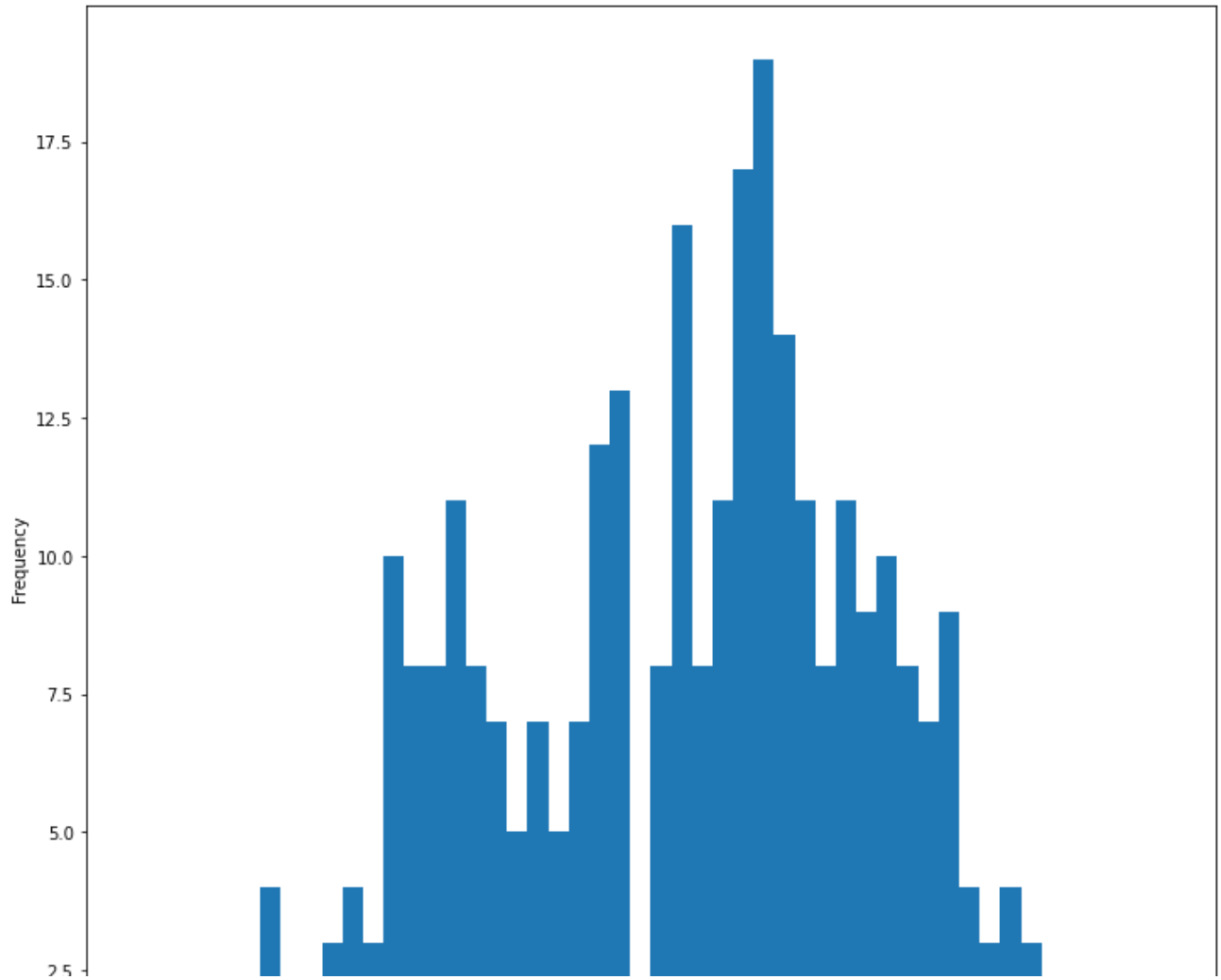



```
# Scatter Plot
# x = Age, y = Cholesterol

df.plot(kind = 'scatter',x = 'age', y = 'chol',alpha = 0.5, color = 'red')
plt.xlabel('Age')
plt.ylabel('Cholesterol')
plt.title('Age-Cholesterol Plot')
```

```
Text(0.5, 1.0, 'Age-Cholesterol Plot')
```

Saved successfully!

```
# Histogram
# Age frequency in data
# bins = number of bar in figure

df.age.plot(kind = 'hist', bins = 50, figsize = (12,12))
plt.show()
```




```
#Outliers Detection and Handling
import matplotlib. pyplot as plt
import seaborn as sb
bxplot = sb.boxplot(df["target"], df["chol"])
plt.show()
sb.boxplot(x='target', y='oldpeak', data=df)
```

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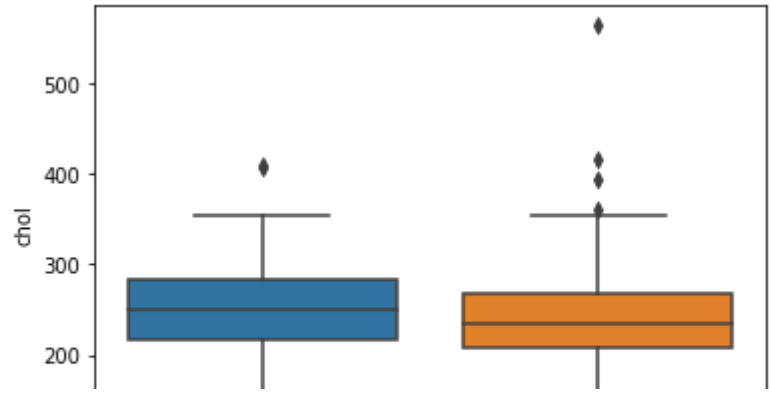
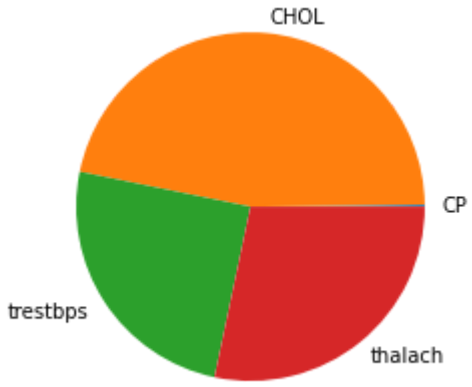
```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pass
  FutureWarning
```




```
# pie chart for CP, CHOL, trestbps, thalach distribution
values = [df.cp.mean(), df.chol.mean(), df.trestbps.mean(), df.thalach.mean()]
labels = ['CP', 'CHOL', 'trestbps', 'thalach']

plt.pie(values, labels=labels)
plt.show()
```




```
# bar chart for Age wise CP
plt.bar(df.age, df.cp)
```

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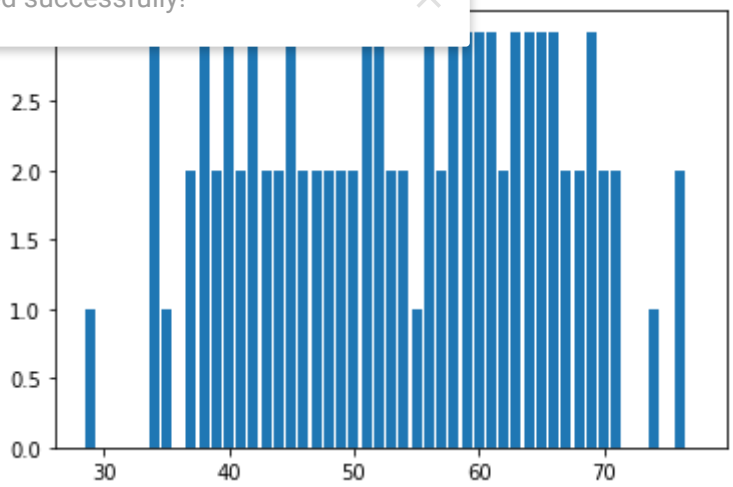
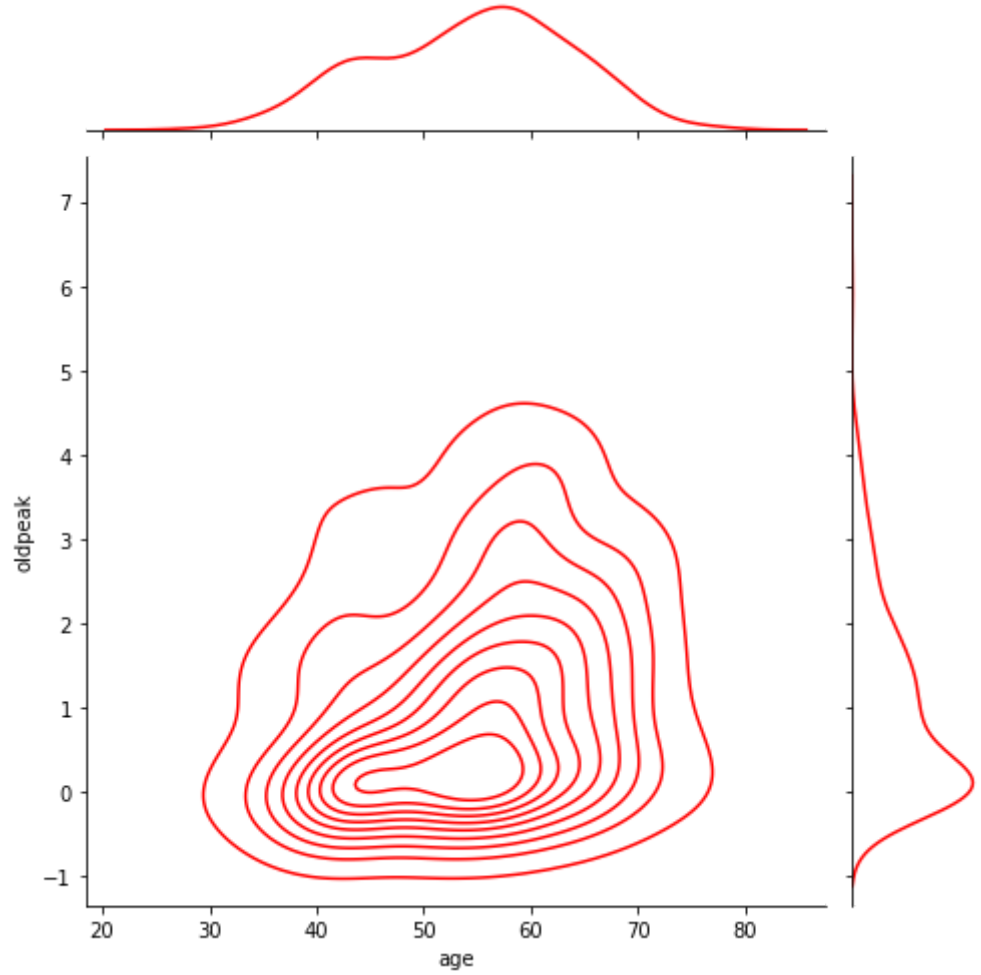
```
<BarContainer object of 303 artists>
```




```
sns.jointplot(df.age,df.oldpeak,color="red",kind="kde",height=7)
plt.savefig('graph.png')
```

```
plt.show()
```

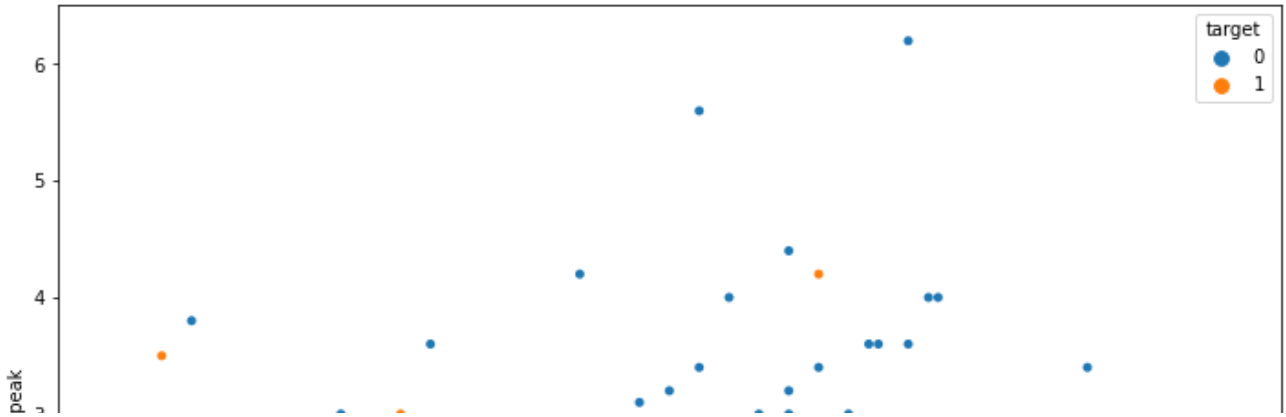
```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pass
  FutureWarning
```




```
#sns.swarmplot(x="age",y="oldpeak",hue="target",color="orange",data=df)
plt.figure(figsize=(12,8))
ax = sns.swarmplot(x="age", y="oldpeak",hue="target",data=df)
#yorum satırındaki ve altındaki aynı şeyler
```

Saved successfully!

```
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 50.6
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 12.5
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 36.4
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 15.4
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 25.6
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 5.9%
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 5.3%
  warnings.warn(msg, UserWarning)
/usr/local/lib/python3.7/dist-packages/seaborn/categorical.py:1296: UserWarning: 14.3
  warnings.warn(msg, UserWarning)
```

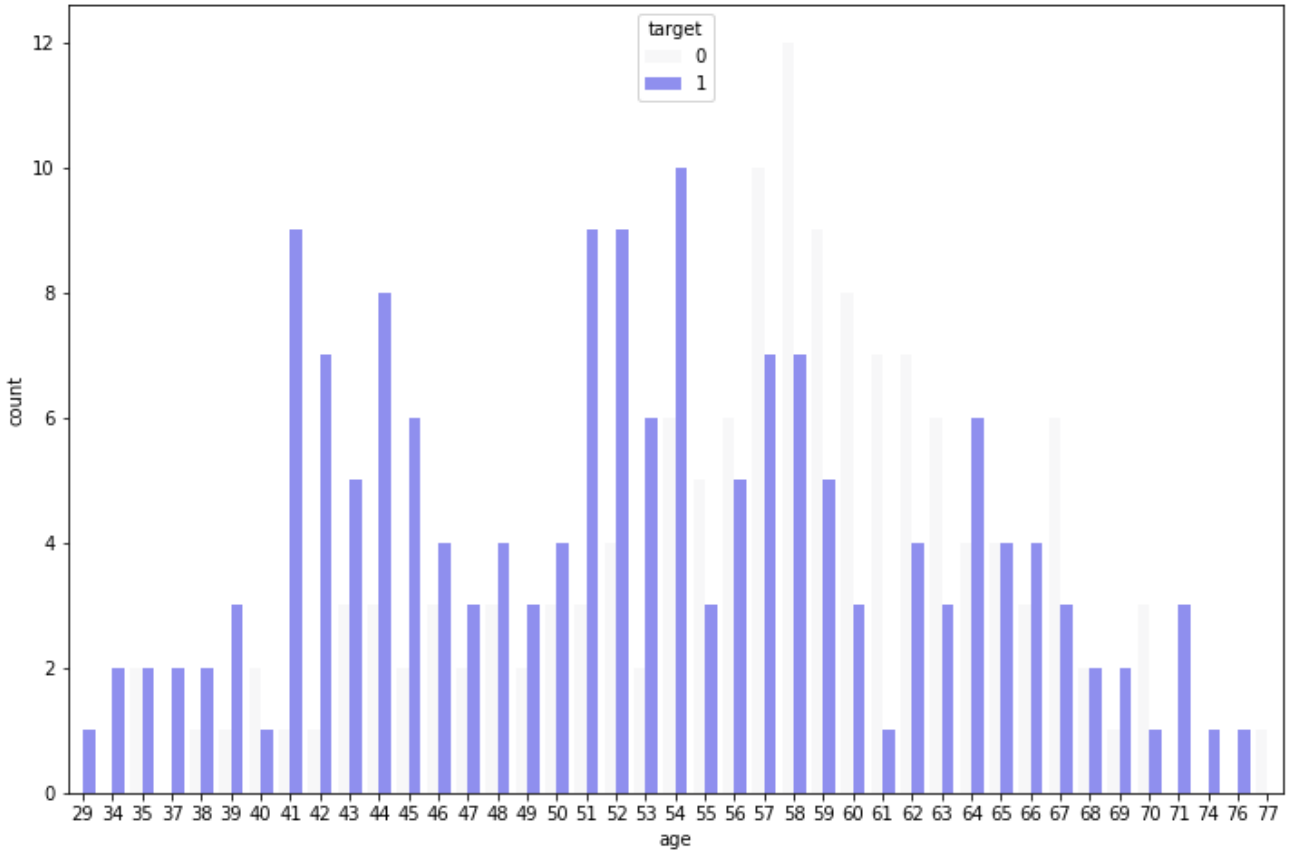



```
plt.figure(figsize=(12,8))
sns.boxplot(df.age,df.oldpeak,color="blue")
plt.show()
```

Saved successfully!

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pass
  FutureWarning
```


```
plt.figure(figsize=(12,8))
sns.countplot(x="age",hue="target",data=df,color="blue",alpha=0.5)
plt.show()
```



Saved successfully!

✓ 3s completed at 12:19 PM

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