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## Lab13. 2D and 3D Data Visualization using Matplotlib and Seaborn

In this lab, you will draw simple 2-dimensional and 3-dimensional charts from matplotlib and seaborn packages.

Question1. Plot all 2D and 3D Plots using Matplotlib and Seaborn.

\* Plot 2D line, bar, histogram and box plot using Matplotlib

\* Histogram and box plot using Seaborn

Reference1: <https://acadgild.com/blog/data-visualization-using-matplotlib-and-seaborn>

Reference2: <https://www.kaggle.com/janani90/data-viz-exercise-matplotlib-and-seaborn>

```
In [1]: import seaborn as sns
import pandas as pd
%matplotlib inline
import matplotlib.pyplot as plt
```

```
In [2]: import numpy as np
```

```
In [3]: from pylab import *
```

```
In [15]: from mpl_toolkits import mplot3d
```

```
In [16]: %matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
```

```
In [34]: data_heart=pd.read_csv("dataset/heart.csv")
data_heart.head()
```

```
Out[34]:
```

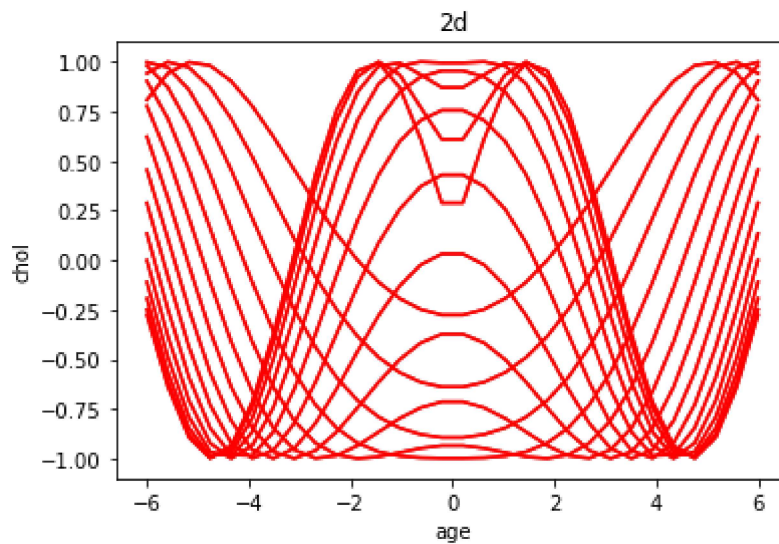
	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal	target
0	63	1	3	145	233	1	0	150	0	2.3	0	0	1	1
1	37	1	2	130	250	0	1	187	0	3.5	0	0	2	1
2	41	0	1	130	204	0	0	172	0	1.4	2	0	2	1
3	56	1	1	120	236	0	1	178	0	0.8	2	0	2	1
4	57	0	0	120	354	0	1	163	1	0.6	2	0	2	1

```
In [39]: x = np.linspace(0, 5, 10)
```

```
y = x ** 2
```

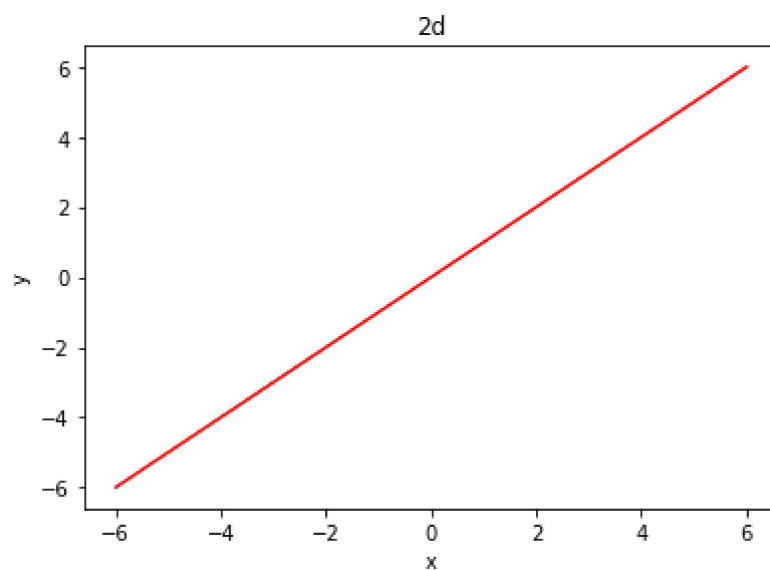
In [26]:

```
figure()
plot(age, chol, 'r')
xlabel('age')
ylabel('chol')
title('2d')
show()
```



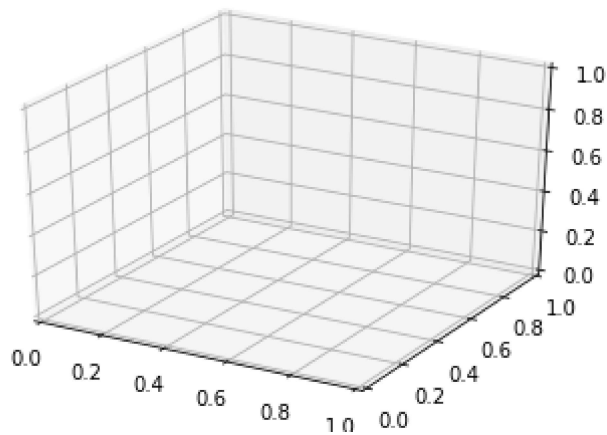
In [33]:

```
fig = plt.figure()
axes = fig.add_axes([0.1, 0.1, 0.8, 0.8]) # left, bottom, width, height (range 0 to
axes.plot(x, y, 'r')
axes.set_xlabel('x')
axes.set_ylabel('y')
axes.set_title('2d');
```



In [17]:

```
fig = plt.figure()
ax = plt.axes(projection='3d')
```

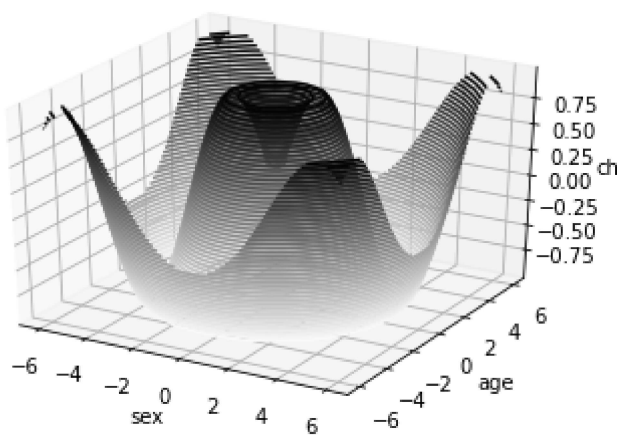


```
In [22]: def f(sex, age):
          return np.sin(np.sqrt(sex ** 2 + age ** 2))

          sex = np.linspace(-6, 6, 30)
          age = np.linspace(-6, 6, 30)

          sex, age = np.meshgrid(x, y)
          chol = f(sex, age)
```

```
In [23]: fig = plt.figure()
          ax = plt.axes(projection='3d')
          ax.contour3D(sex, age, chol, 50, cmap='binary')
          ax.set_xlabel('sex')
          ax.set_ylabel('age')
          ax.set_zlabel('chol');
```



```
In [9]: data_heart.dtypes
```

```
Out[9]: age          int64
        sex          int64
        cp           int64
        trestbps      int64
        chol          int64
        fbs           int64
        restecg       int64
        thalach        int64
        exang         int64
        oldpeak       float64
        slope         int64
        ca            int64
        thal          int64
```

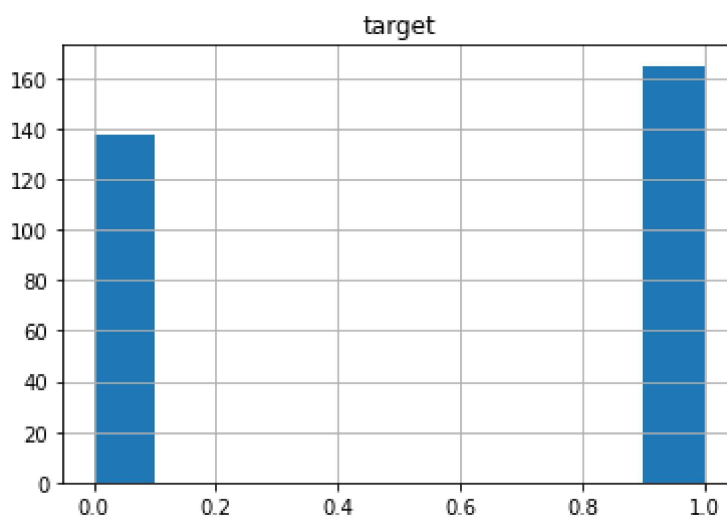
```
target      int64
dtype: object
```

```
In [10]: data_heart.count()
```

```
Out[10]: age      303
sex        303
cp         303
trestbps   303
chol       303
fbs        303
restecg    303
thalach    303
exang      303
oldpeak    303
slope      303
ca         303
thal       303
target     303
dtype: int64
```

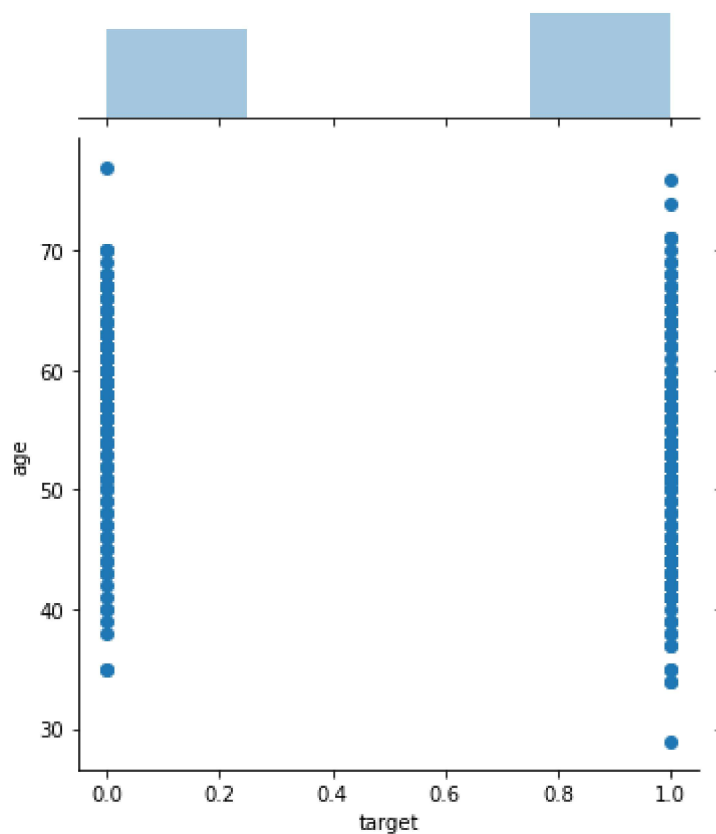
```
In [11]: data_heart.hist('target')
```

```
Out[11]: array([[<matplotlib.axes._subplots.AxesSubplot object at 0x000001BA6FAC71F0>]],
      dtype=object)
```



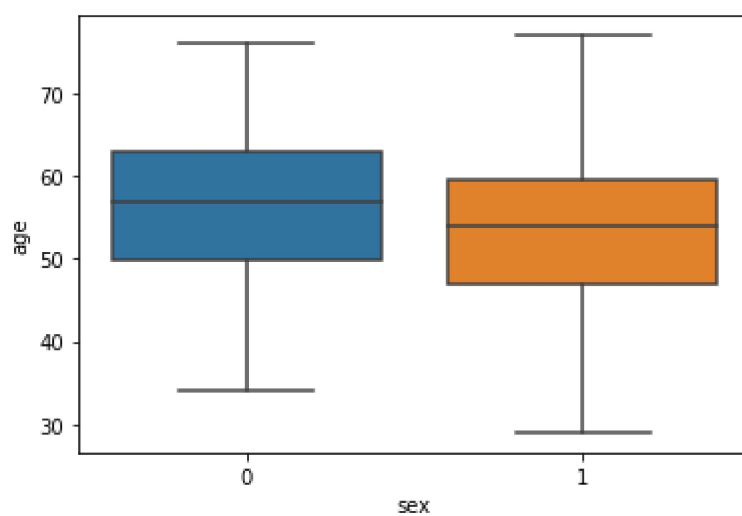
```
In [12]: sns.jointplot(x='target',y='age',data=data_heart)
```

```
Out[12]: <seaborn.axisgrid.JointGrid at 0x1ba6fb50880>
```



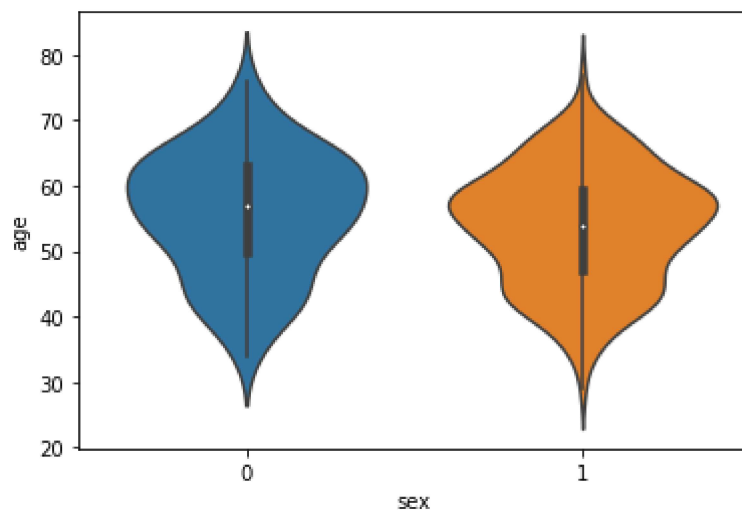
```
In [13]: sns.boxplot(x='sex',y='age',data=data_heart)
```

```
Out[13]: <matplotlib.axes._subplots.AxesSubplot at 0x1ba6fc5ceb0>
```



```
In [14]: sns.violinplot(x='sex',y='age',data=data_heart)
```

```
Out[14]: <matplotlib.axes._subplots.AxesSubplot at 0x1ba6fcd6100>
```



```
In [38]: my_dict={'age':30,'cp':65,'sex':50,'chol':80}
for i,k in my_dict.items():
    print(i,k)
    plt.bar(i,k)
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.show()
```

age 30  
cp 65  
sex 50  
chol 80

