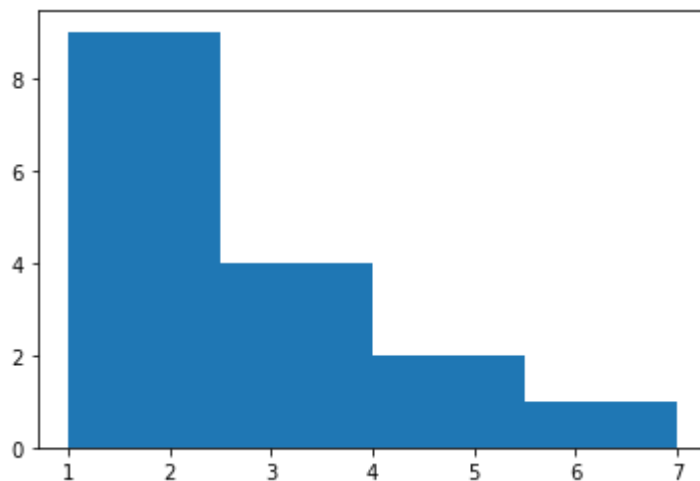


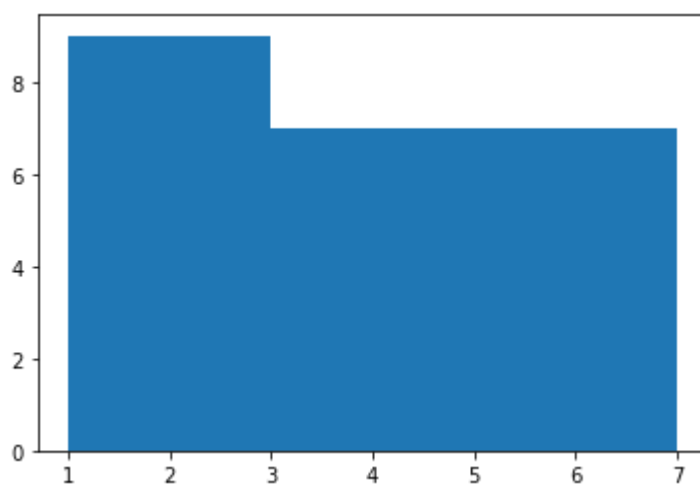
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

[+ Code](#)[+ Text](#)

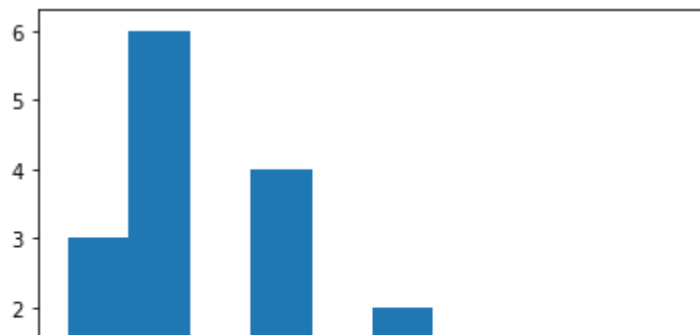
```
vals=[1,2,3,1,2,3,3,2,4,3,2,1,2,2,4,7]
plt.hist(vals,bins=4)
plt.show()
```



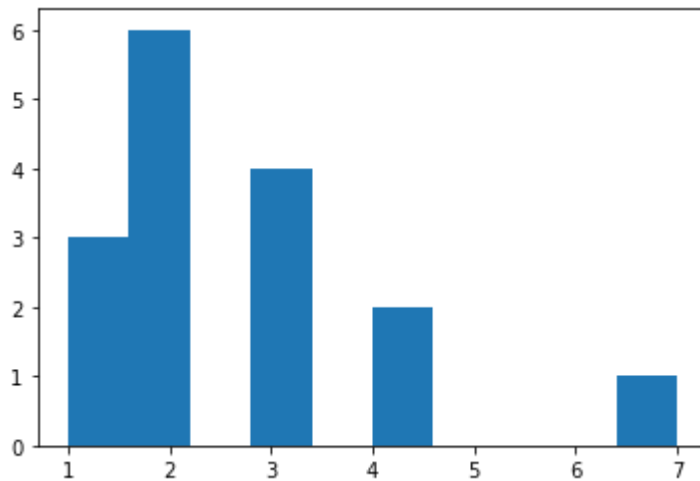
```
vals=[1,2,3,1,2,3,3,2,4,3,2,1,2,2,4,7]
plt.hist(vals,bins=[1,3,7])
plt.show()
```



```
vals=[1,2,3,1,2,3,3,2,4,3,2,1,2,2,4,7]
plt.hist(vals)
plt.show()
```



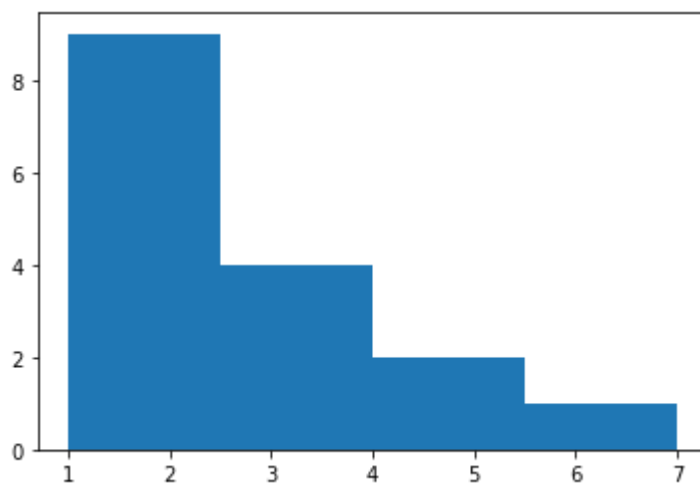
```
vals=[1,2,3,1,2,3,3,2,4,3,2,1,2,2,4,7]
n,bins,_ = plt.hist(vals)
plt.show()
```



```
print(n)
print(bins)
```

```
[3. 6. 0. 4. 0. 2. 0. 0. 0. 1.]
[1.  1.6 2.2 2.8 3.4 4.  4.6 5.2 5.8 6.4 7. ]
```

```
vals=[1,2,3,1,2,3,3,2,4,3,2,1,2,2,4,7]
n,bins,_ = plt.hist(vals,bins=4)
plt.show()
```

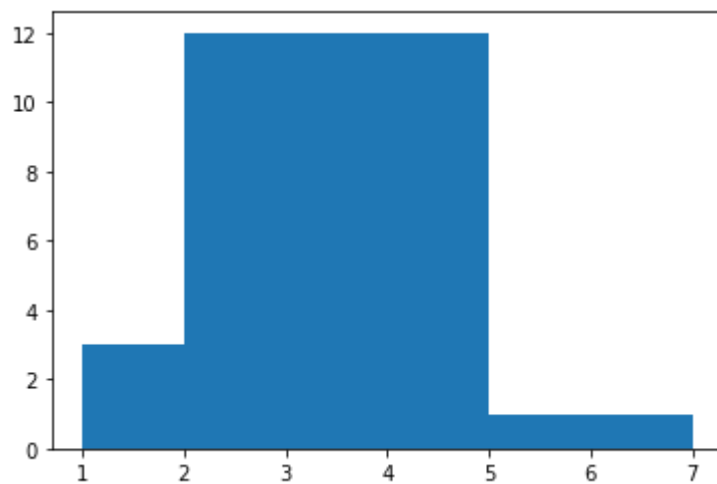


```
print(n)
```

```
print(bins)
```

```
[9.  4.  2.  1.]  
[1.  2.5  4.  5.5  7. ]
```

```
vals=[1,2,3,1,2,3,3,2,4,3,2,1,2,2,4,7]  
n,bins,_ = plt.hist(vals,bins=[1,2,5,7])  
plt.show()
```



```
print(n)  
print(bins)
```

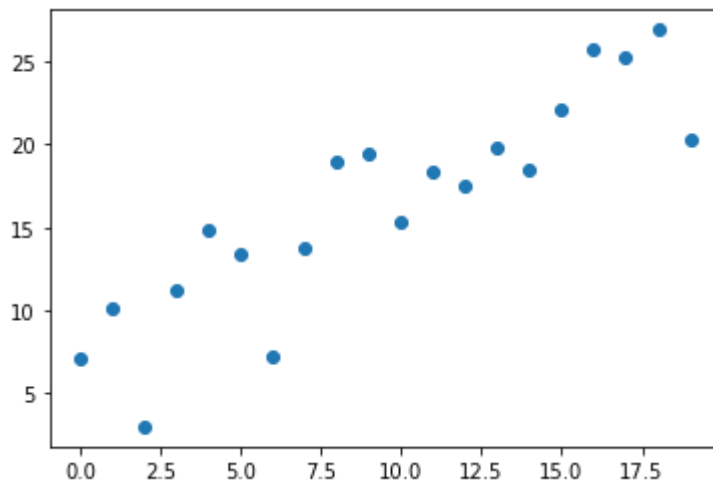
```
[ 3. 12.  1.]  
[1 2 5 7]
```

```
x = np.arange(0,20)  
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10  
print(x)  
print(y)  
plt.plot(x,y)  
plt.show()
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
[ 7.85305167  5.73965123  9.42621523  8.79469129 13.55202236 12.48789548
 7.46328888 16.79000776 15.80069412 10.05643084 14.57604178 16.67183383
18.71795751 23.32112971 24.49467458 23.04342535 22.76423544 19.68425562
22.14196565 28.5261706 ]
```

```
x = np.arange(0,20)
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10
print(x)
print(y)
plt.scatter(x,y)
plt.show()
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
[ 7.15485018 10.17216757  3.01262693 11.28068293 14.82437751 13.40311716
 7.23293669 13.8231406  18.96396166 19.42866898 15.29660574 18.30564403
17.55652708 19.75793484 18.49791359 22.10609954 25.77217952 25.20099069
26.92275976 20.31757565]
```



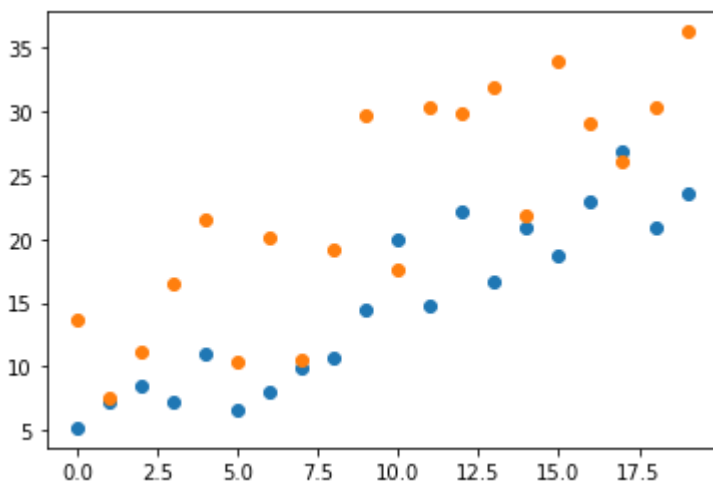
```
x = np.arange(0,20)
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10
y2 = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*20
print(x)
print(y)
print(y2)
plt.scatter(x,y)
plt.scatter(x,y2)
plt.show()
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
[ 4.43014829  4.43195677  6.11854567  5.17115875  9.16178076 15.99293094
 7.85076933 11.44869966 15.19173925 15.44670891 13.19483527 12.24269977
14.86309281 15.2525563 17.70101402 22.54198514 18.53846828 19.51865244
20.80796596 22.81082526]
[ 5.24662168 11.02407048 16.7369205  7.63481275 14.98633854 25.4677919
14.50217659 17.58409707 27.54618615 20.4957776 24.77670547 27.58932304
20.26897836 26.56834751 28.17106135 23.08521561 27.1745234 34.35727221
28.1095304 21.35795319]
```



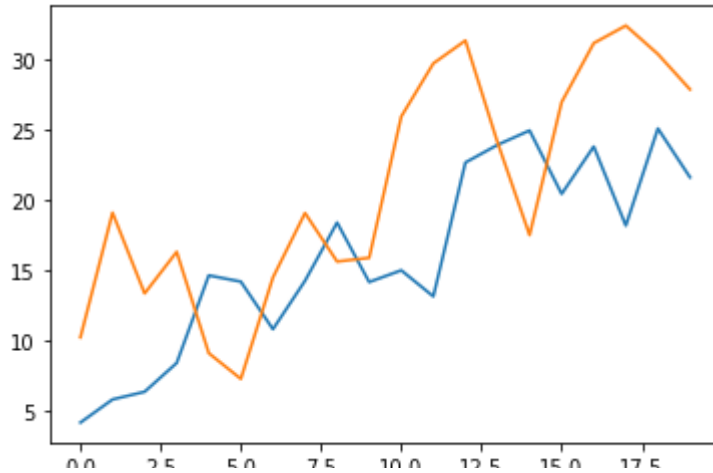
```
x = np.arange(0,20)
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10
y2 = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*20
print(x)
print(y)
print(y2)
plt.scatter(x,y)
plt.scatter(x,y2)
plt.show()
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
[ 5.18933924  7.27556219  8.51778376  7.27993475 11.03353814  6.58484145
 7.95564359  9.95053049 10.67828979 14.40122068 19.98572812 14.74541366
22.2012843 16.64170134 20.86661865 18.71319466 22.99706131 26.93495484
20.92664488 23.50954056]
[13.63311479  7.56168414 11.19209066 16.5045321 21.48015371 10.3782364
20.12683911 10.44781582 19.14364035 29.7580058 17.63937327 30.39146526
29.7992395 31.90793026 21.77797408 33.93458626 29.03985712 26.06962952
30.39070034 36.26860448]
```



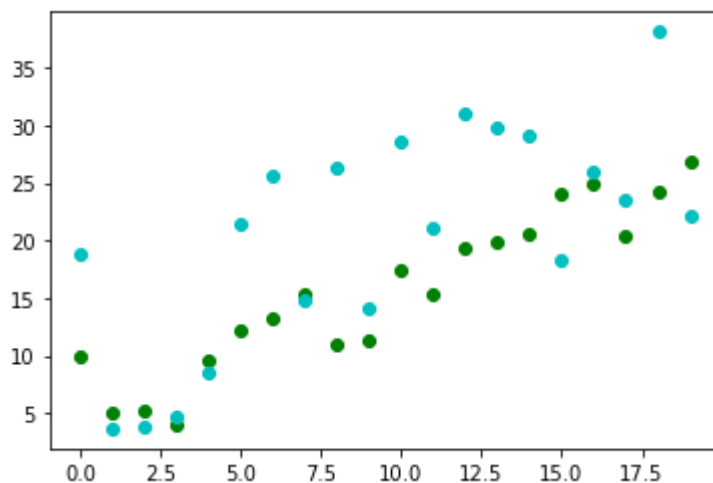
```
x = np.arange(0,20)
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10
y2 = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*20
print(x)
print(y)
print(y2)
plt.plot(x,y)
plt.plot(x,y2)
plt.show()
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
[ 4.12818545  5.77041292  6.31541619  8.36497096 14.58836998 14.14566117
10.76465019 14.20710286 18.34498568 14.11748932 14.94944409 13.09694894
22.61092923 23.86654693 24.88773377 20.38049245 23.74838712 18.12889153
25.03023539 21.55914671]
[10.18838803 19.04376017 13.30639891 16.26098131  9.06025446  7.23256591
14.4395972  19.02068636 15.57440926 15.83663853 25.88038523 29.657353
31.28234251 24.05164287 17.45472949 26.90596336 31.09691511 32.34429574
30.32138355 27.8103341 ]
```



```
x = np.arange(0,20)
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10
y2 = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*20

plt.scatter(x,y,color="g")
plt.scatter(x,y2,color="c")
plt.show()
```

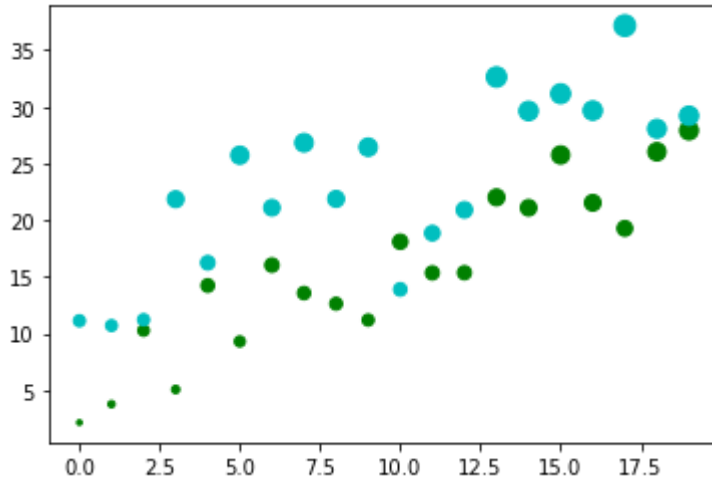


```

x = np.arange(0,20)
y = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*10
y2 = np.linspace(1,20,20,dtype=np.int32)+np.random.rand(20)*20

plt.scatter(x,y,color="g",s=3*(y))
plt.scatter(x,y2,color="c",s=3*(y2))
plt.show()

```



4*abs(y)

```

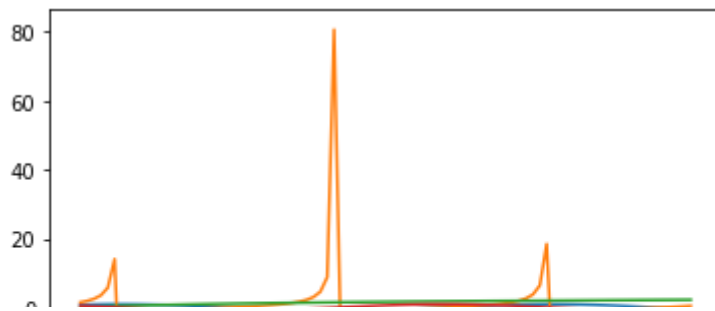
array([32.22123962,  8.94592157, 27.31923261, 35.66147284, 59.13173454,
       50.22465523, 67.12342418, 33.14054563, 68.85520076, 58.79792507,
       44.30292342, 80.01266376, 91.33939764, 87.03130523, 94.26373578,
       77.09200865, 99.44064716, 92.73644072, 84.63689282, 99.3806265 ])

```

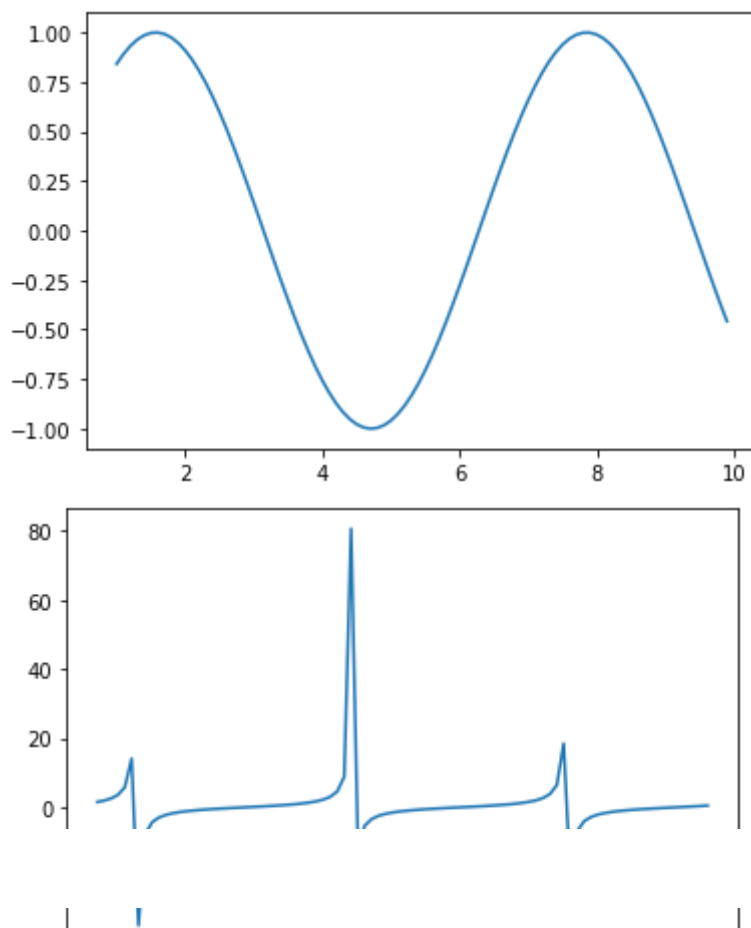
```

x=np.arange(1,10,0.1)
y=np.sin(x)
y2=np.tan(x)
y3=np.log(x)
y4=np.cos(x)
plt.plot(x,y)
plt.plot(x,y2)
plt.plot(x,y3)
plt.plot(x,y4)
plt.show()

```

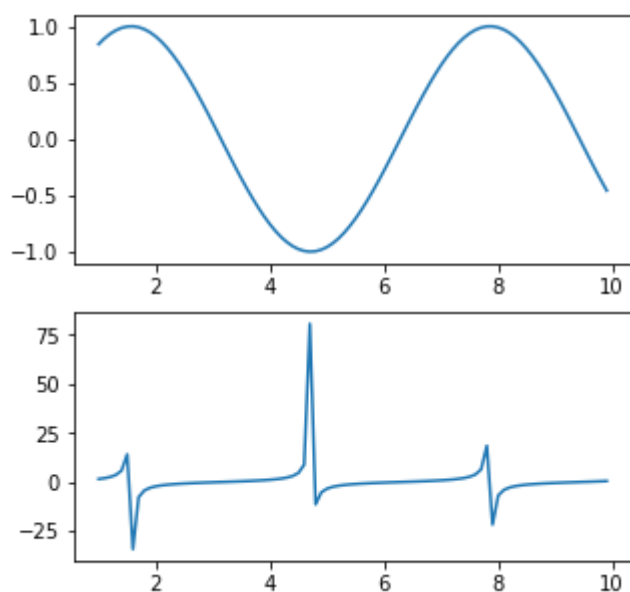


```
x=np.arange(1,10,0.1)
y=np.sin(x)
y2=np.tan(x)
y3=np.log(x)
y4=np.cos(x)
plt.plot(x,y)
plt.show()
plt.plot(x,y2)
plt.show()
plt.plot(x,y3)
plt.show()
plt.plot(x,y4)
plt.show()
```

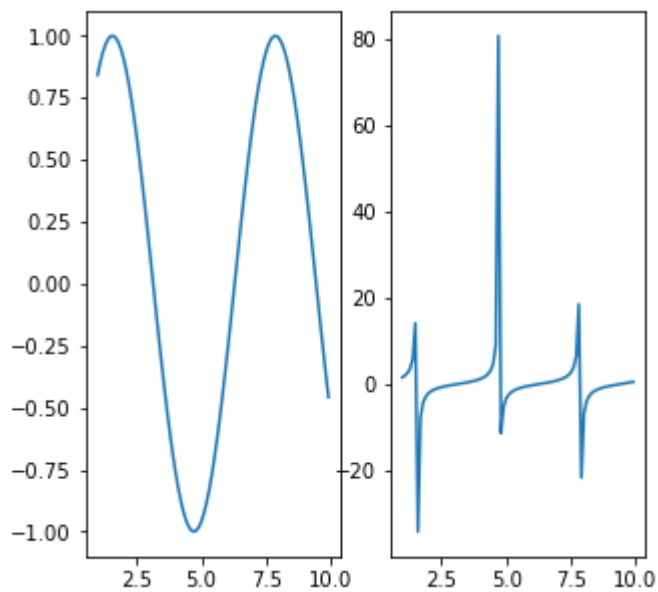



```
x=np.arange(1,10,0.1)
y=np.sin(x)
y2=np.tan(x)
y3=np.log(x)
y4=np.cos(x)
```

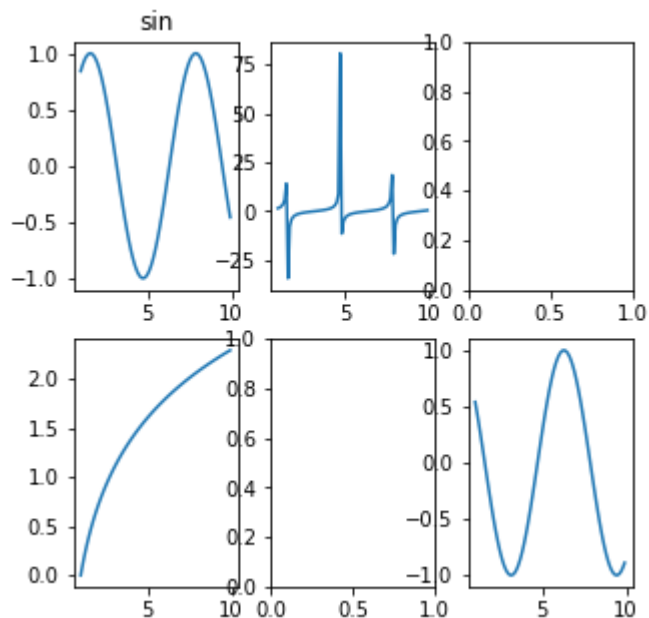
```
fig,ax=plt.subplots(2,1,figsize=(5,5))
ax[0].plot(x,y)
ax[1].plot(x,y2)
plt.show()
```

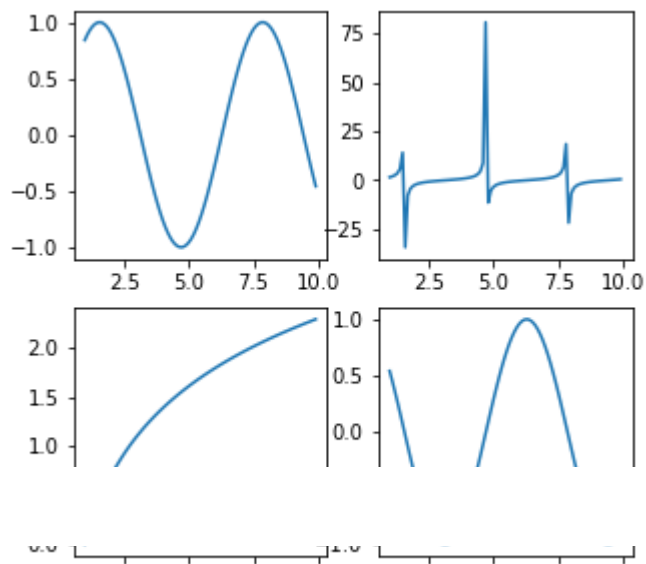


```
fig,ax=plt.subplots(1,2,figsize=(5,5))
ax[0].plot(x,y)
ax[1].plot(x,y2)
plt.show()
```



```
fig,ax=plt.subplots(2,3,figsize=(5,5))
ax[0,0].plot(x,y)
ax[0,1].plot(x,y2)
ax[1,0].plot(x,y3)
ax[1,2].plot(x,y4)
plt.show()
```





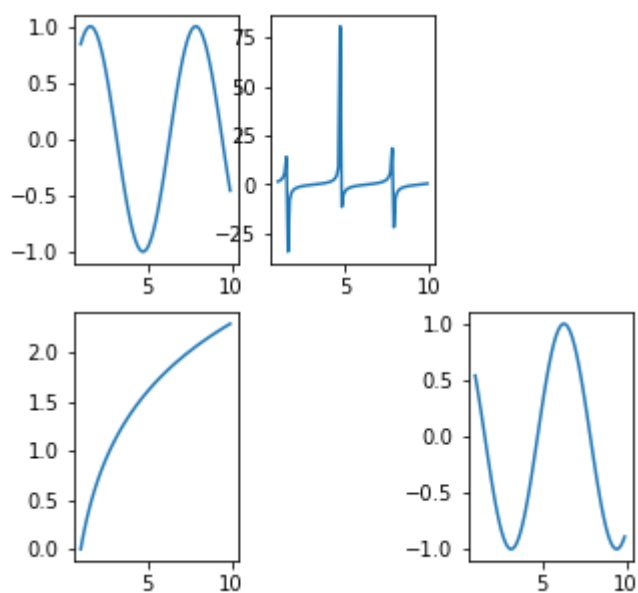
```
x=np.arange(1,10,0.1)
y=np.sin(x)
y2=np.tan(x)
y3=np.log(x)
y4=np.cos(x)
```

```
plt.figure(figsize=(5,5))
plt.subplot(2,3,1)
plt.plot(x,y)
```

```
plt.subplot(2,3,2)
plt.plot(x,y2)
```

```
plt.subplot(2,3,4)
plt.plot(x,y3)
```

```
plt.subplot(2,3,6)
plt.plot(x,y4)
plt.show()
```



```
!pip install seaborn
```

```
import seaborn as sns
```

```
iris=sns.load_dataset("iris")
tips=sns.load_dataset("tips")
```

iris

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

150 rows × 5 columns

tips

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
2	21.01	3.50	Male	No	Sun	Dinner	3

```
iris.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 5 columns):
#   Column          Non-Null Count  Dtype
---  -
0   sepal_length    150 non-null    float64
1   sepal_width     150 non-null    float64
2   petal_length    150 non-null    float64
3   petal_width     150 non-null    float64
4   species         150 non-null    object
dtypes: float64(4), object(1)
memory usage: 6.0+ KB

244 rows x 7 columns
```

```
iris.describe()
```

	sepal_length	sepal_width	petal_length	petal_width
count	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.057333	3.758000	1.199333
std	0.828066	0.435866	1.765298	0.762238
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.350000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

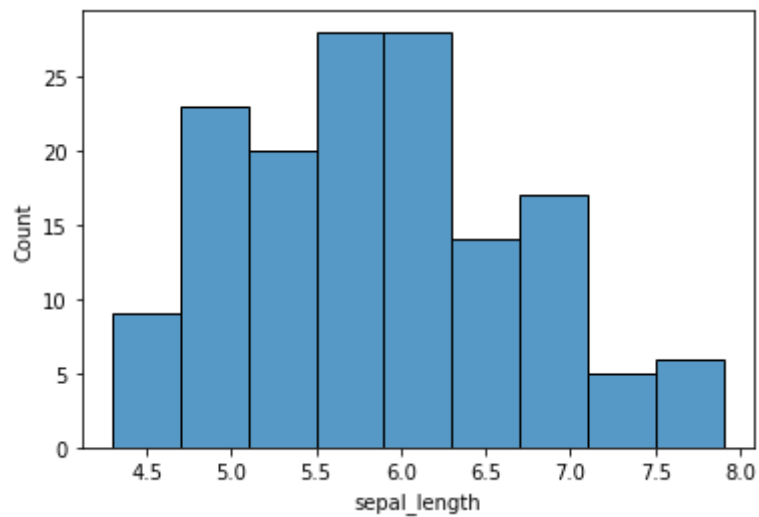
```
sns.histplot(iris["petal_length"])
```

```
<AxesSubplot:xlabel='petal_length', ylabel='Count'>
```



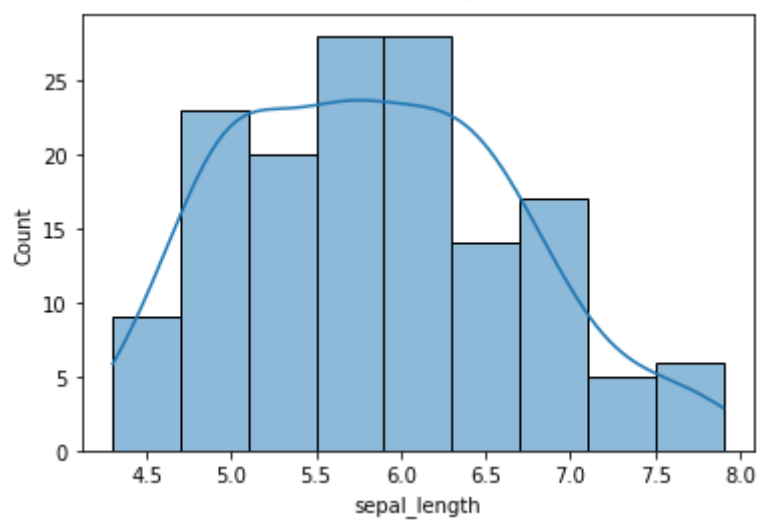
```
sns.histplot(iris["sepal_length"])
```

```
<AxesSubplot:xlabel='sepal_length', ylabel='Count'>
```

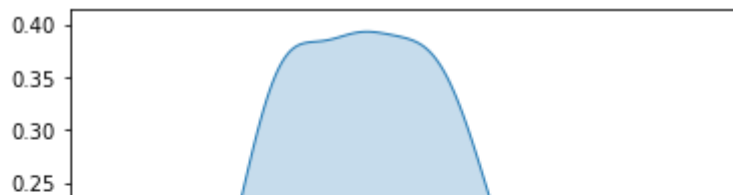


```
sns.histplot(iris["sepal_length"], kde=True)
```

```
<AxesSubplot:xlabel='sepal_length', ylabel='Count'>
```

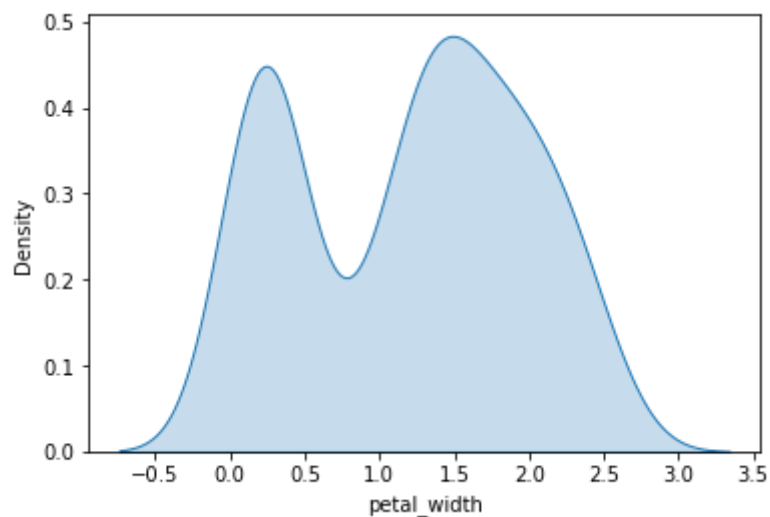


```
sns.kdeplot(iris["sepal_length"], shade=True)  
plt.show()
```



```
sns.kdeplot(iris["petal_width"], shade=True)
```

```
<AxesSubplot:xlabel='petal_width', ylabel='Density'>
```



```
np.random.seed(10)
```

```
print(np.random.rand())
print(np.random.rand())
```

```
0.6336482349262754
0.7488038825386119
```

```
a=np.array([1,2,3,4,1,2,23,1,4,2,3,1,2,3,4])
np.unique(a,return_counts=True)
```

```
(array([ 1,  2,  3,  4, 23]), array([4, 4, 3, 3, 1]))
```


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