

```
In [67]: iris=pd.read_csv('https://gist.githubusercontent.com/netj/8836201/raw/6f9306
<IPython.core.display.Javascript object>
```

```
In [68]: iris_sepal_length=iris[['sepal.length']]
```

```
In [69]: iris_sepal_length
```

```
Out[69]:
```

	sepal.length
0	5.1
1	4.9
2	4.7
3	4.6
4	5.0
...	...
145	6.7
146	6.3
147	6.5
148	6.2
149	5.9

150 rows × 1 columns

```
In [6]: iris.shape
```

```
Out[6]: (150, 5)
```

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

```
Out[9]: sepal.length    float64
sepal.width    float64
petal.length    float64
petal.width    float64
variety        object
dtype: object
```

```
In [17]: iris['sepal.length'] = iris['sepal.length'].astype(float)
```

```
In [18]: iris.dtypes
```

```
Out[18]: sepal.length    float64
sepal.width    float64
petal.length    float64
petal.width    float64
variety        object
dtype: object
```

In [66]: `iris.head(3)`

Out[66]:

	sepal.length	sepal.width	petal.length	petal.width	variety
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

In [39]: `import pandas as pd`  
`import numpy as np`

In [30]: `print(iris.columns)`

```
Index(['sepal.length', 'sepal.width', 'petal.length', 'petal.width',
      'variety'],
      dtype='object')
```

In [36]: `value_counts = iris['variety'].value_counts()`  
`print(value_counts)`

```
variety
Setosa      50
Versicolor  50
Virginica   50
Name: count, dtype: int64
```

In [42]: `iris.describe()`

Out[42]:

	sepal.length	sepal.width	petal.length	petal.width
count	150.000000	150.000000	150.000000	150.000000
mean	5.386667	3.057333	3.758000	1.199333
std	0.841752	0.435866	1.765298	0.762238
min	4.000000	2.000000	1.000000	0.100000
25%	5.000000	2.800000	1.600000	0.300000
50%	5.000000	3.000000	4.350000	1.300000
75%	6.000000	3.300000	5.100000	1.800000
max	7.000000	4.400000	6.900000	2.500000

In [44]: `iris.isna().sum()`

Out[44]:

```
sepal.length    0
sepal.width     0
petal.length    0
petal.width     0
variety         0
dtype: int64
```

```
In [45]: iris.dtypes
```

```
Out[45]: sepal.length    float64
sepal.width    float64
petal.length    float64
petal.width    float64
variety        object
dtype: object
```

```
In [47]: #insights from sanity checking
```

```
In [48]: value_counts = iris['variety'].value_counts()
print(value_counts)
```

```
variety
Setosa      50
Versicolor  50
Virginica   50
Name: count, dtype: int64
```

```
In [54]: grouped_data=iris.groupby('variety')
mean_value=grouped_data.mean()
print(mean_value)
```

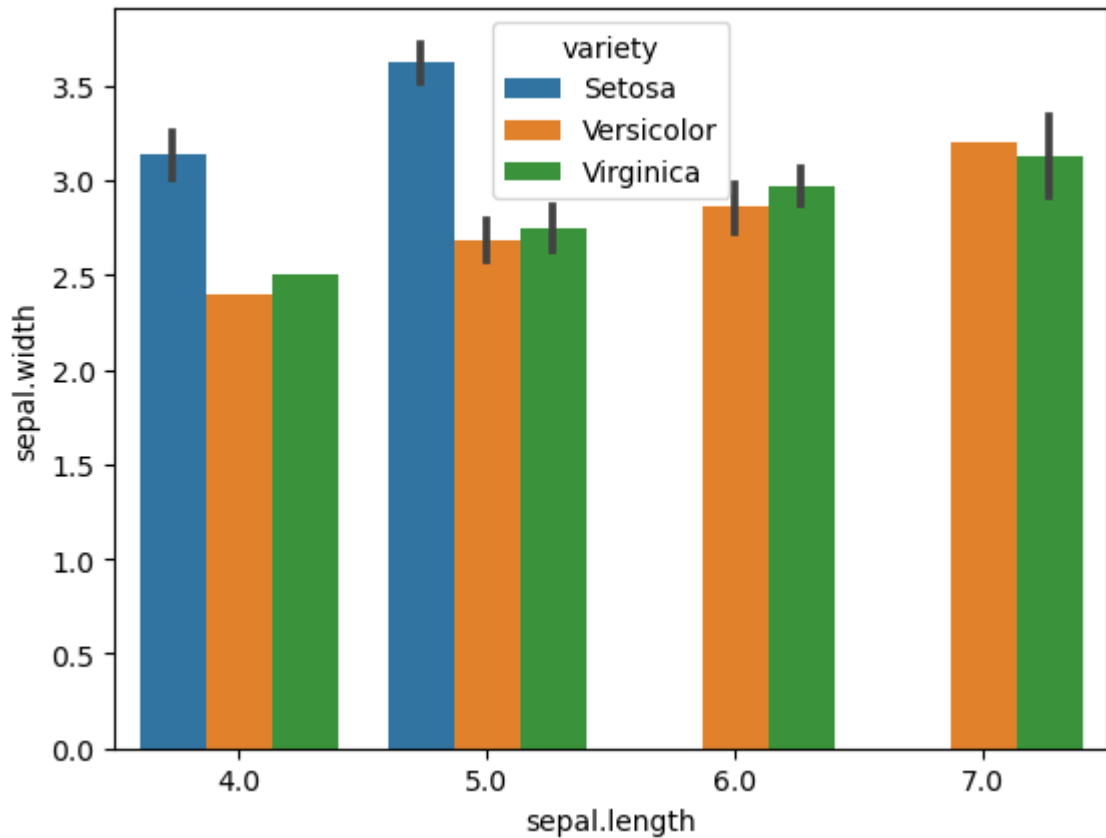
	sepal.length	sepal.width	petal.length	petal.width
variety				
Setosa	4.60	3.428	1.462	0.246
Versicolor	5.48	2.770	4.260	1.326
Virginica	6.08	2.974	5.552	2.026

```
In [55]: import seaborn as sns
```

## Bar plot in seaborn library

```
In [58]: sns.barplot(x="sepal.length",y="sepal.width",data=iris,hue="variety")
```

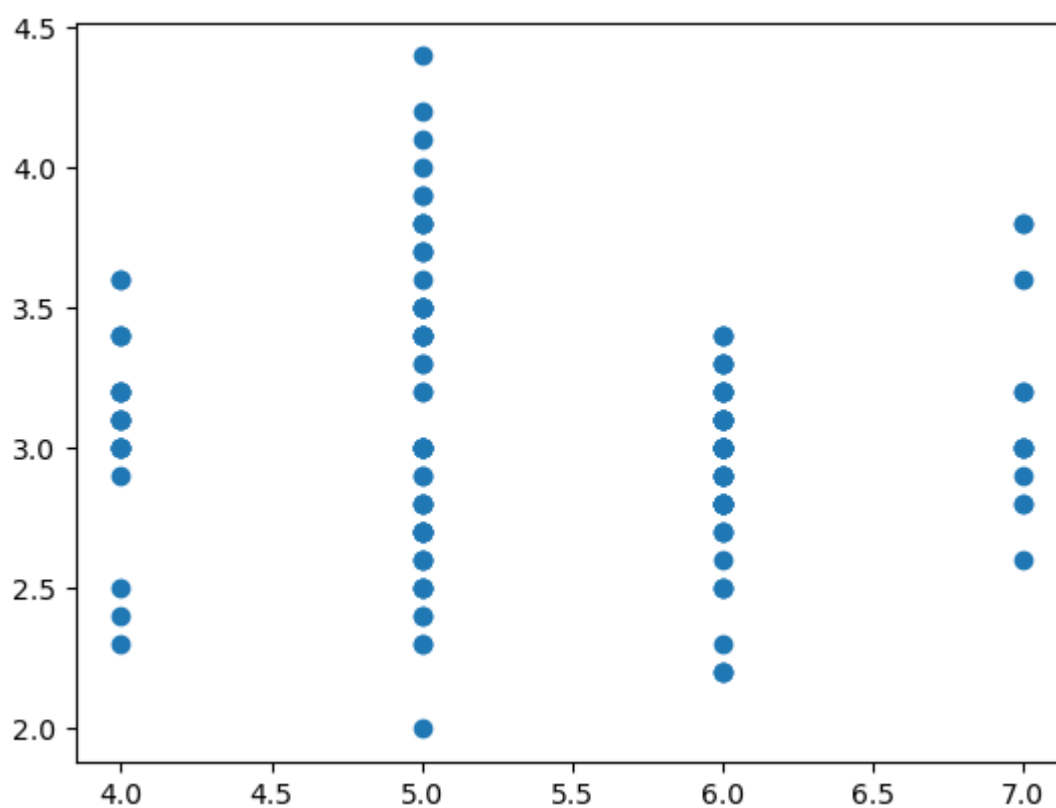
```
Out[58]: <AxesSubplot:xlabel='sepal.length', ylabel='sepal.width'>
```



```
In [64]: import matplotlib.pyplot as plt
```

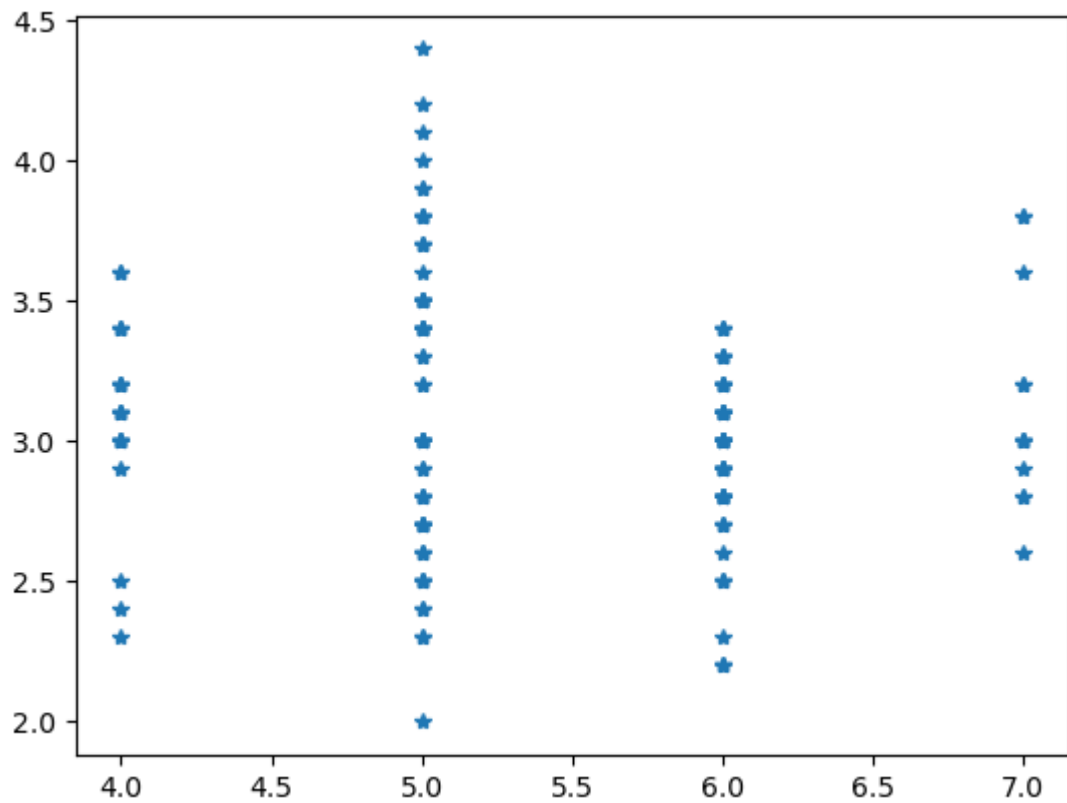
## Plot graph with o

```
In [72]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,'o')  
plt.show()
```



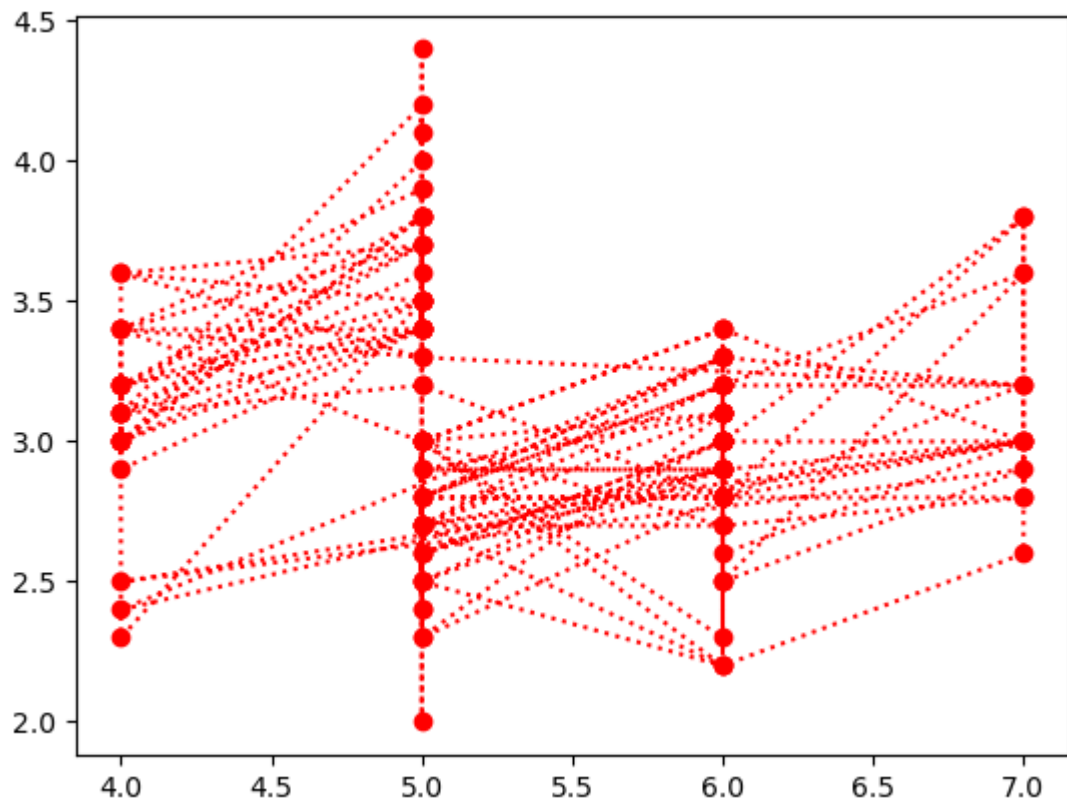
**Plot graph with \***

```
In [73]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,'*')  
plt.show()
```



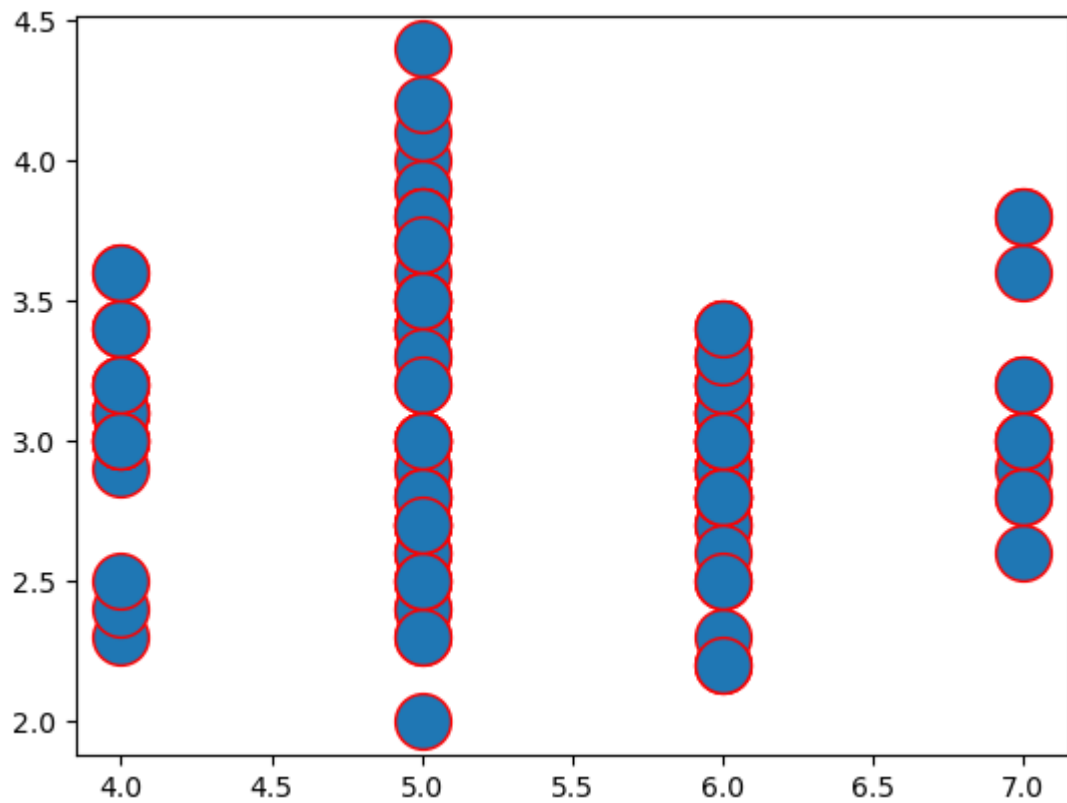
**PLot graph with iri dataframe ' o:r'**

```
In [74]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,'o:r')  
plt.show()
```



**plot graph with macker size(ms) & marker  
edge color**

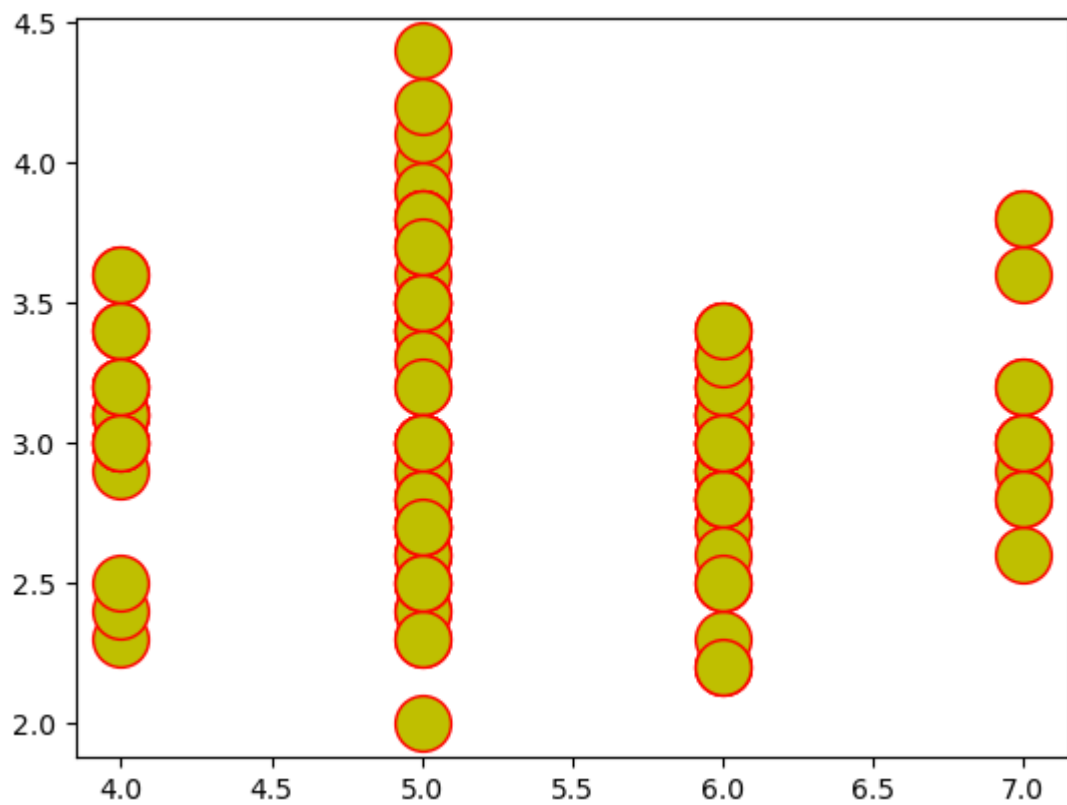
```
In [76]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,'o',ms=20,mec='r')  
plt.show()
```



**plot graph with ms,mec,marker face color**

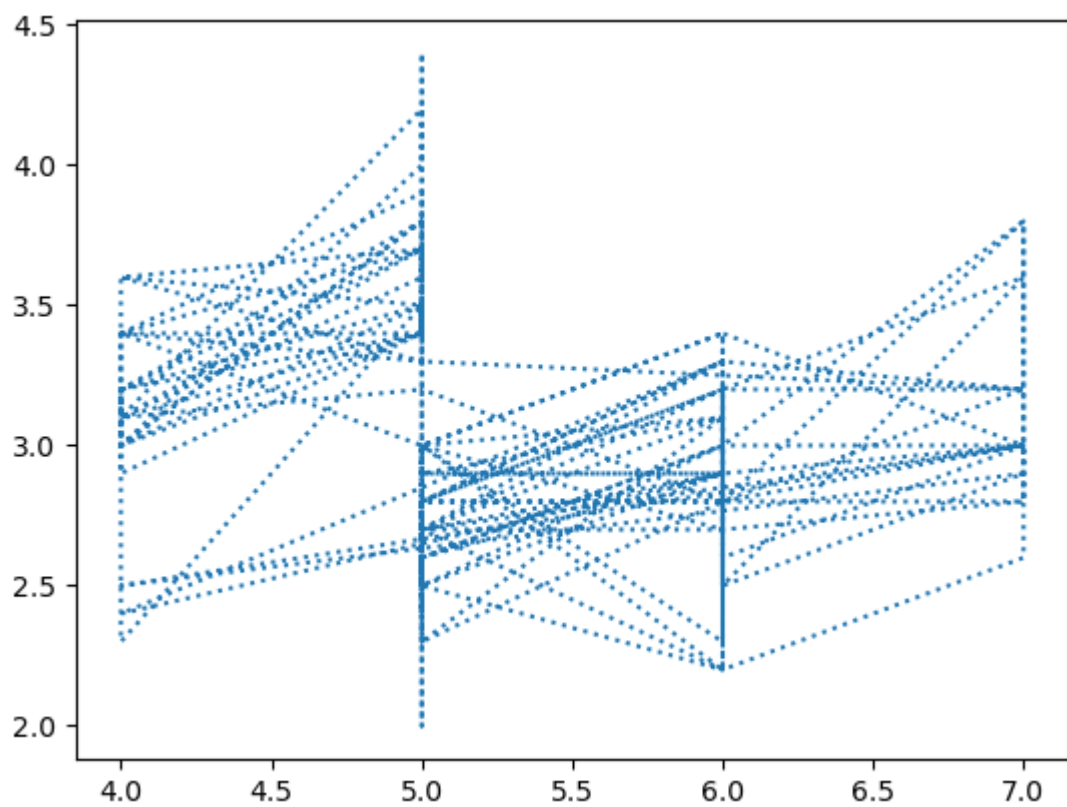


```
In [79]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,'o',ms=20,mec='r',mfc='y')  
plt.show()
```



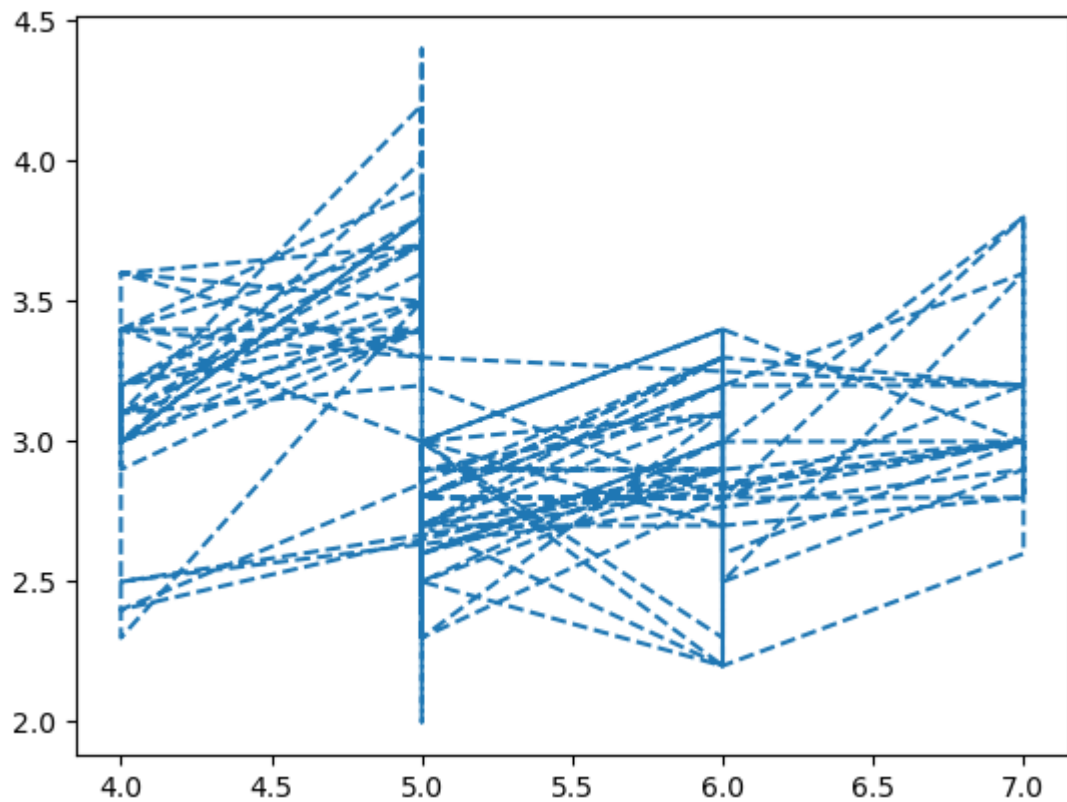
**plot graph with linestyle ,dotted**

```
In [80]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,linestyle='dotted')  
plt.show()
```



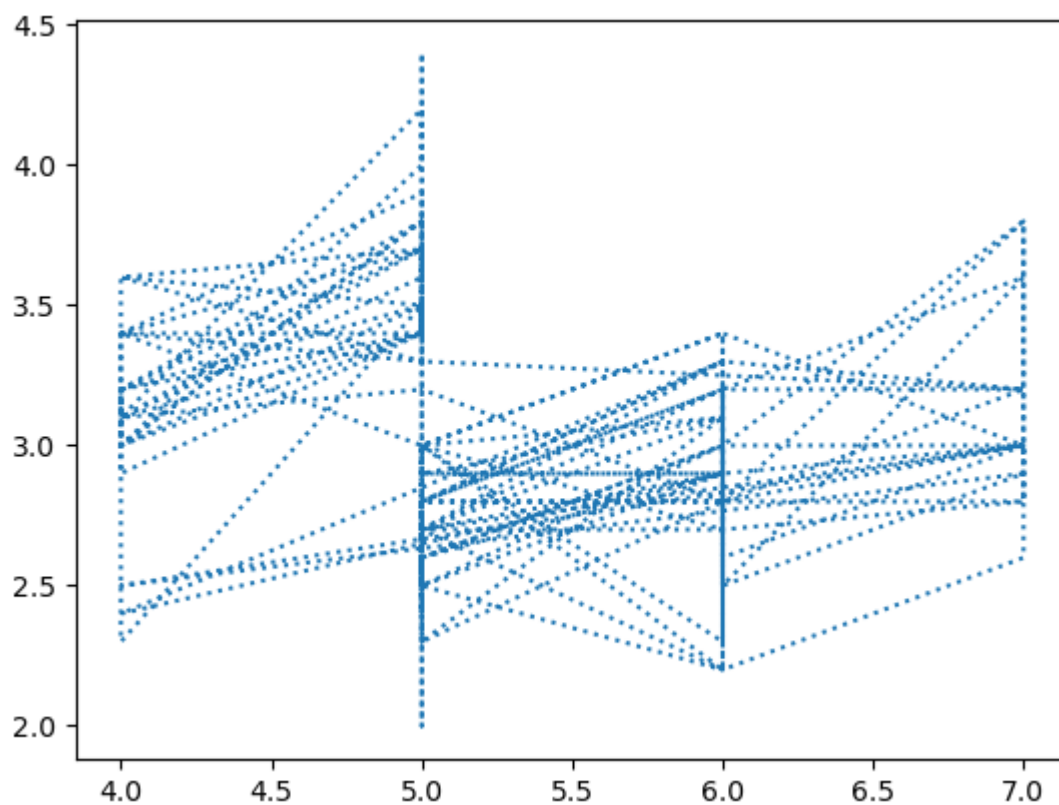
In [81]:

```
xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,linestyle='dashed')  
plt.show()
```

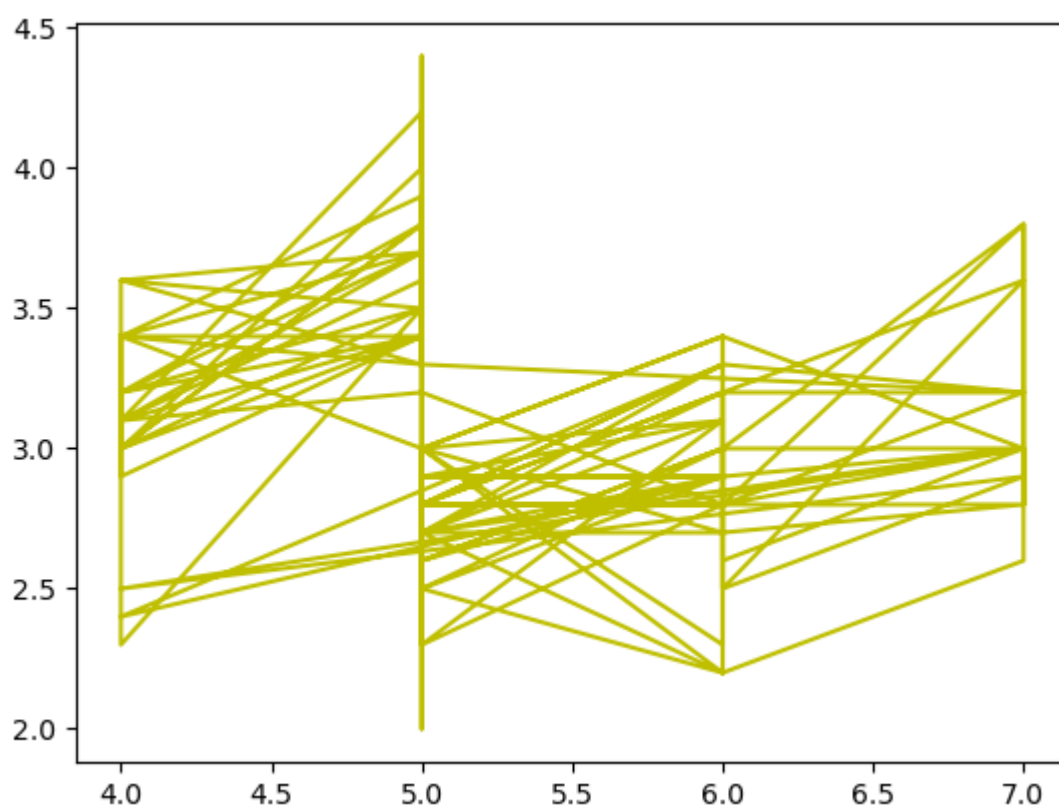


**plot graph with :**

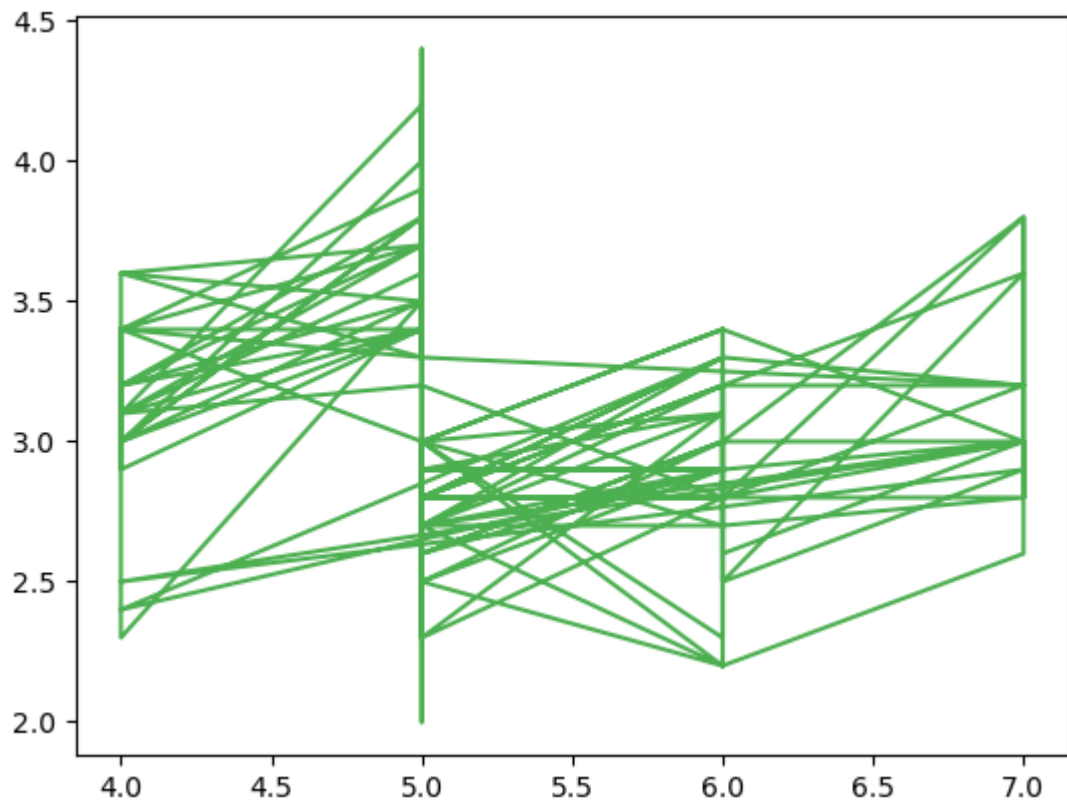
```
In [82]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,ls=':')  
plt.show()
```



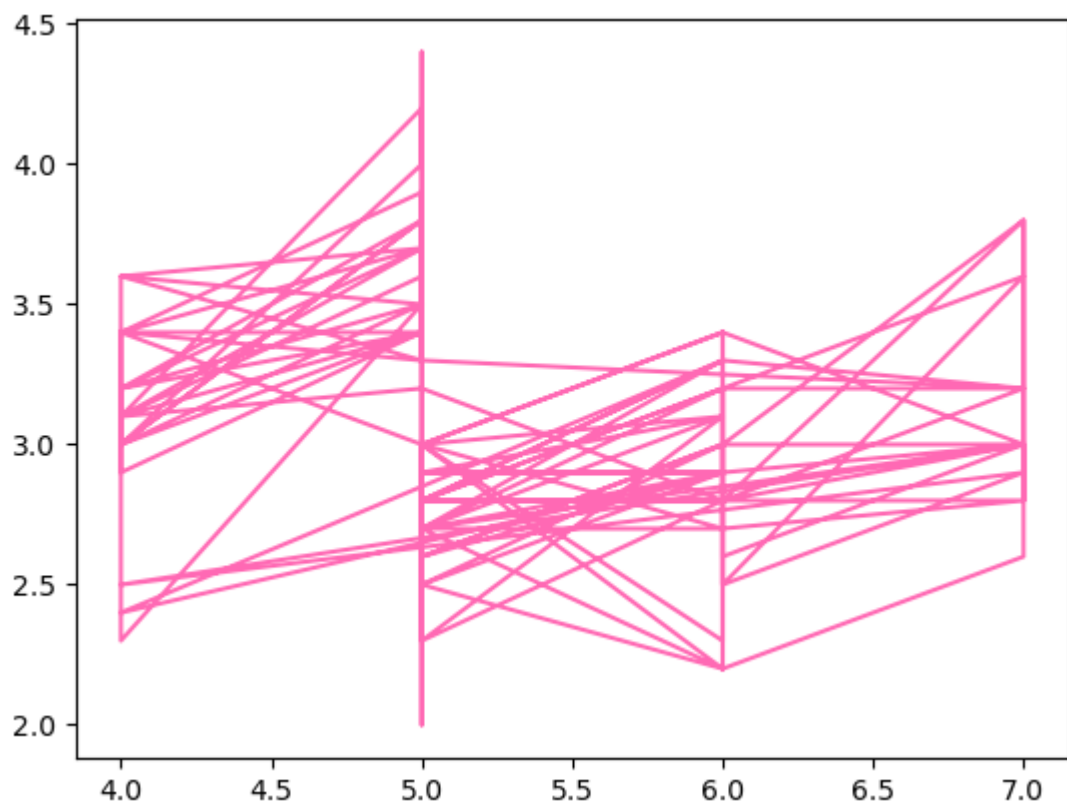
```
In [84]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,color='y')  
plt.show()
```



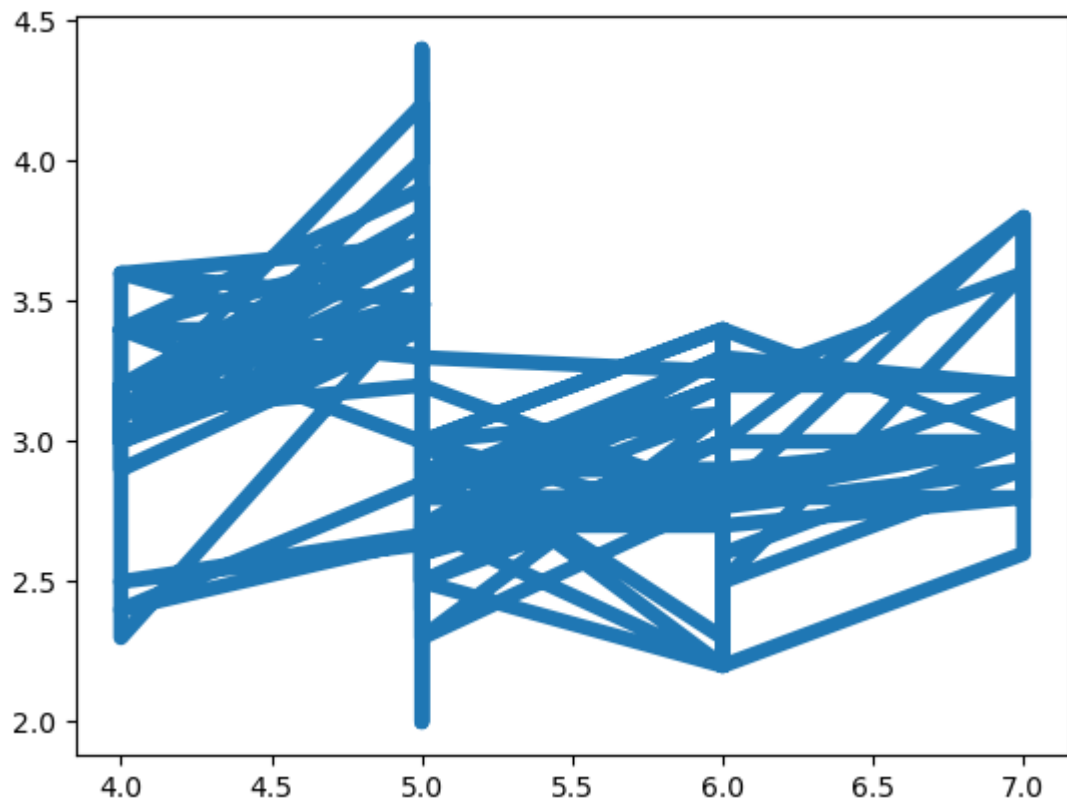
```
In [85]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,c='#4CAF50')  
plt.show()
```



```
In [86]: xpoints=iris['sepal.length']  
ypoints=iris['sepal.width']  
plt.plot(xpoints,ypoints,c='hotpink')  
plt.show()
```



```
In [90]: xpoints=iris['sepal.length']
ypoints=iris['sepal.width']
plt.plot(xpoints,ypoints,linewidth='5.4')
plt.show()
```

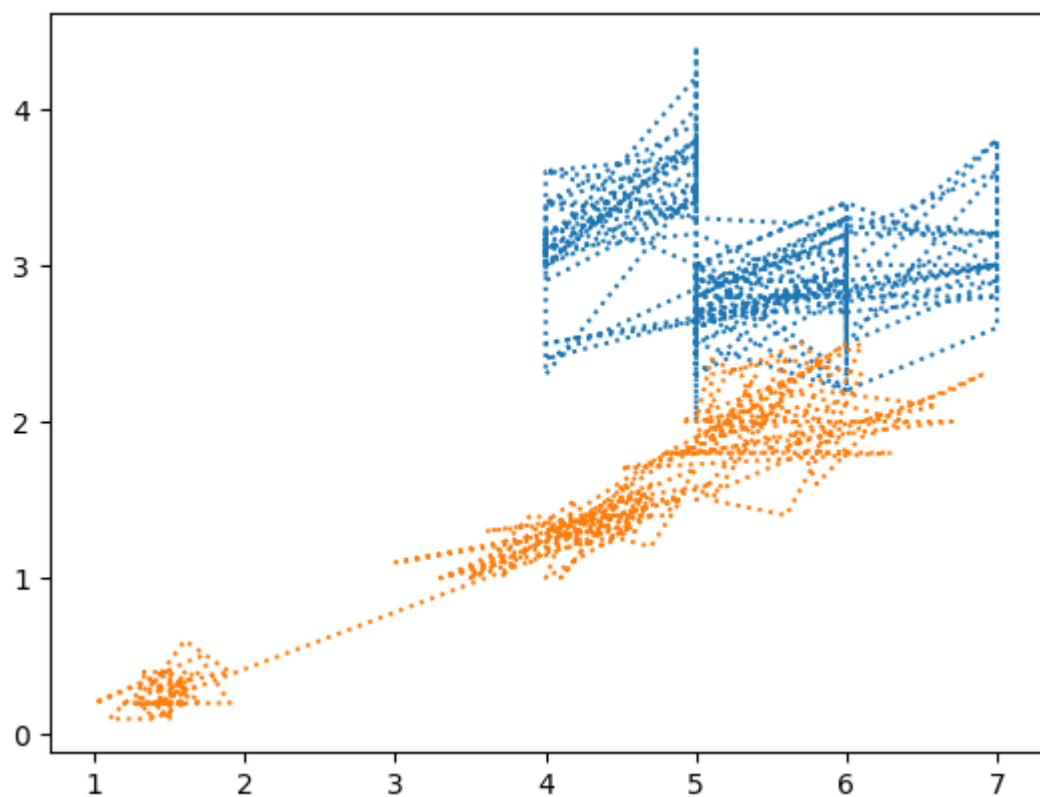


```
In [92]: iris.head()
```

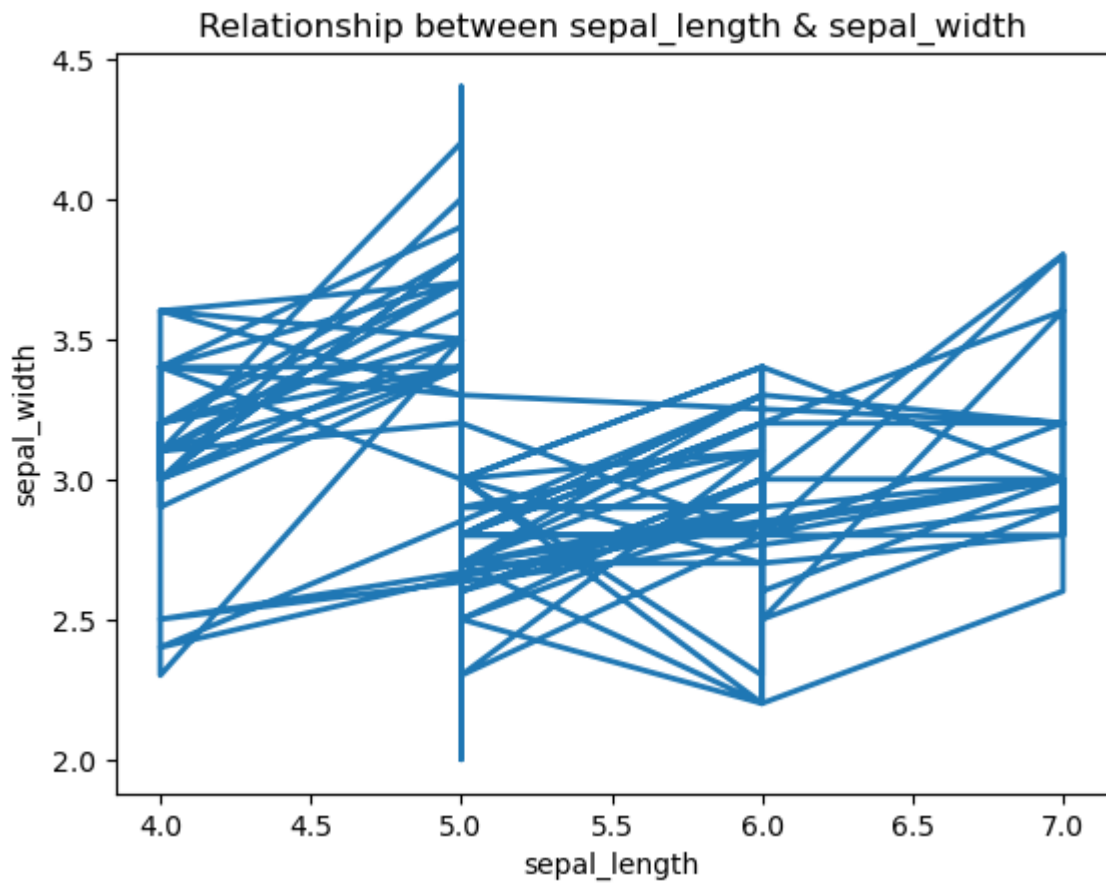
```
Out[92]:
```

	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.0	3.5	1.4	0.2	Setosa
1	4.0	3.0	1.4	0.2	Setosa
2	4.0	3.2	1.3	0.2	Setosa
3	4.0	3.1	1.5	0.2	Setosa
4	5.0	3.6	1.4	0.2	Setosa

```
In [96]: y1=iris['sepal.length']  
y2=iris['sepal.width']  
y3=iris['petal.length']  
y4=iris['petal.width']  
plt.plot(y1,y2,y3,y4,linestyle='dotted')  
plt.show()
```



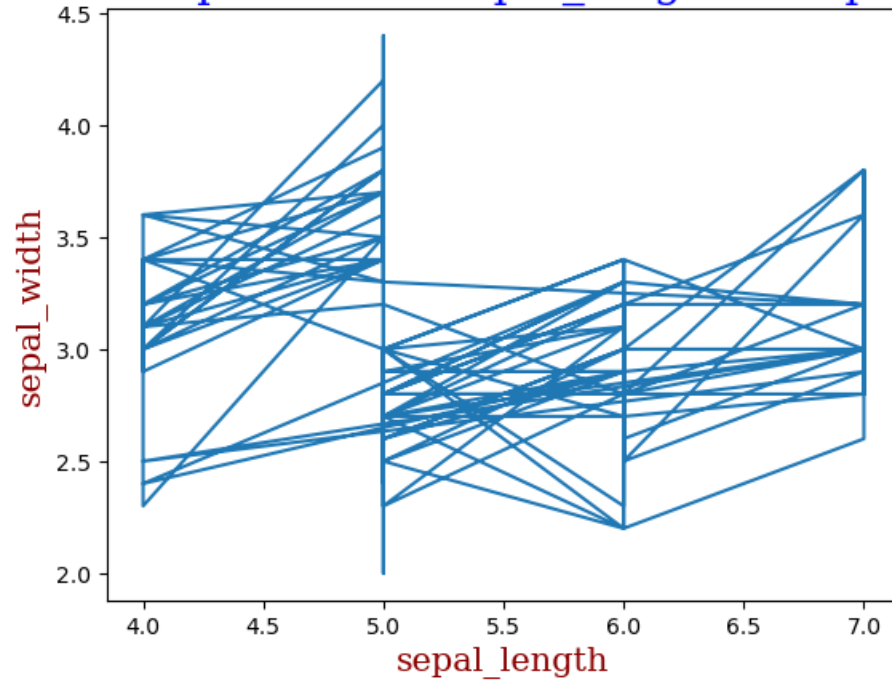
```
In [98]: x=iris['sepal.length']  
y=iris['sepal.width']  
plt.plot(x,y,linewidth='2')  
plt.title("Relationship between sepal_length & sepal_width")  
plt.xlabel("sepal_length")  
plt.ylabel("sepal_width")  
plt.show()
```



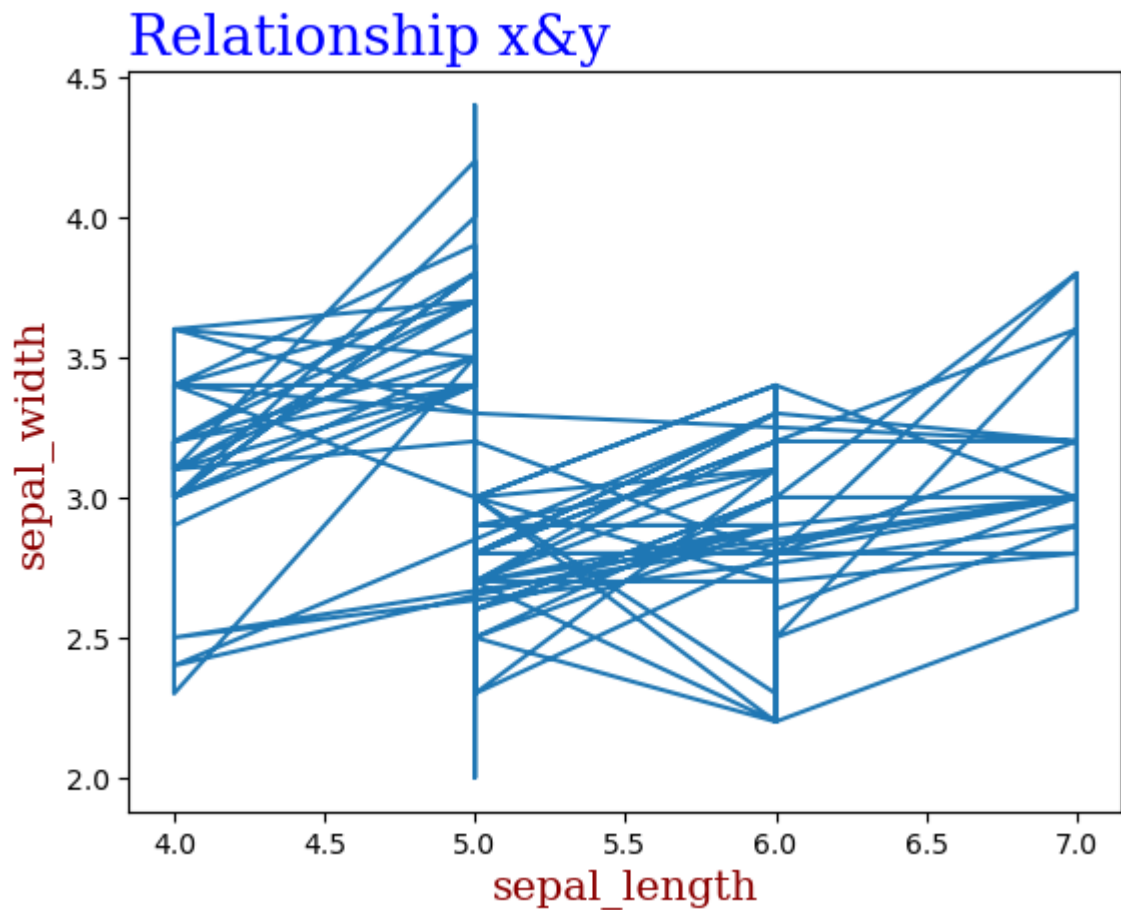


```
In [100]: x=iris['sepal.length']
y=iris['sepal.width']
plt.plot(x,y)
font1={'family':'serif','color':'blue','size':20}
font2={'family':'serif','color':'darkred','size':15}
plt.title("Relationship between sepal_length & sepal_width",fontdict=font1)
plt.xlabel("sepal_length",fontdict=font2)
plt.ylabel("sepal_width",fontdict=font2)
plt.show()
```

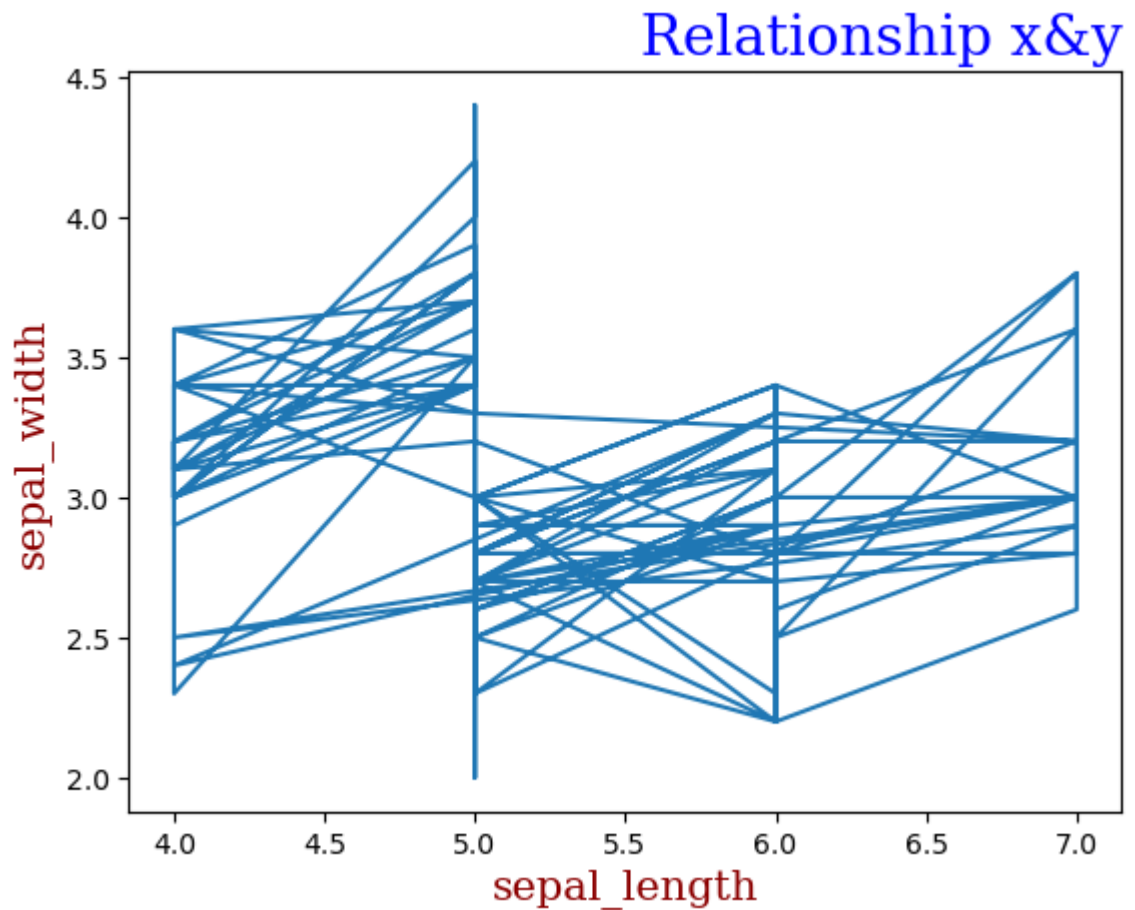
## Relationship between sepal\_length & sepal\_width



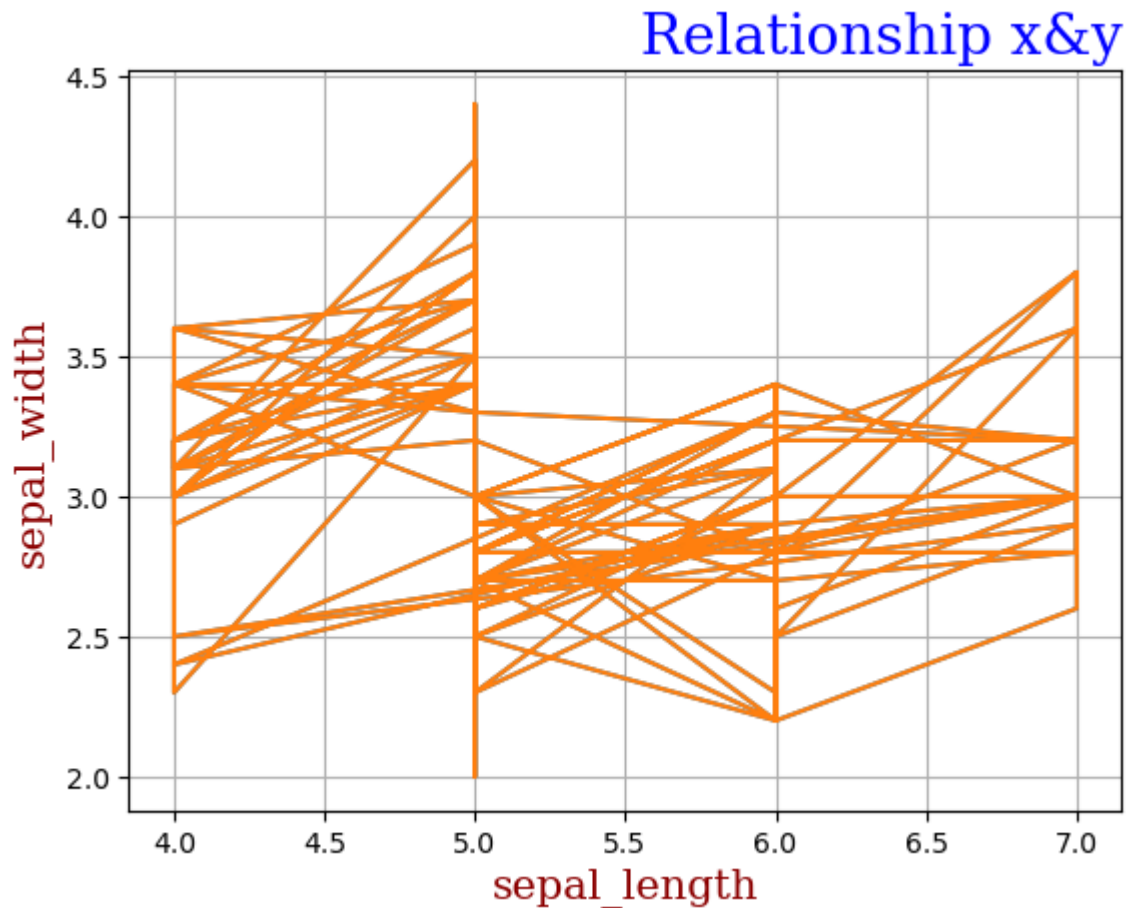
```
In [101]: x=iris['sepal.length']  
y=iris['sepal.width']  
plt.plot(x,y)  
font1={'family':'serif','color':'blue','size':20}  
font2={'family':'serif','color':'darkred','size':15}  
plt.title("Relationship x&y",loc='left',fontdict=font1)  
plt.xlabel("sepal_length",fontdict=font2)  
plt.ylabel("sepal_width",fontdict=font2)  
plt.show()
```



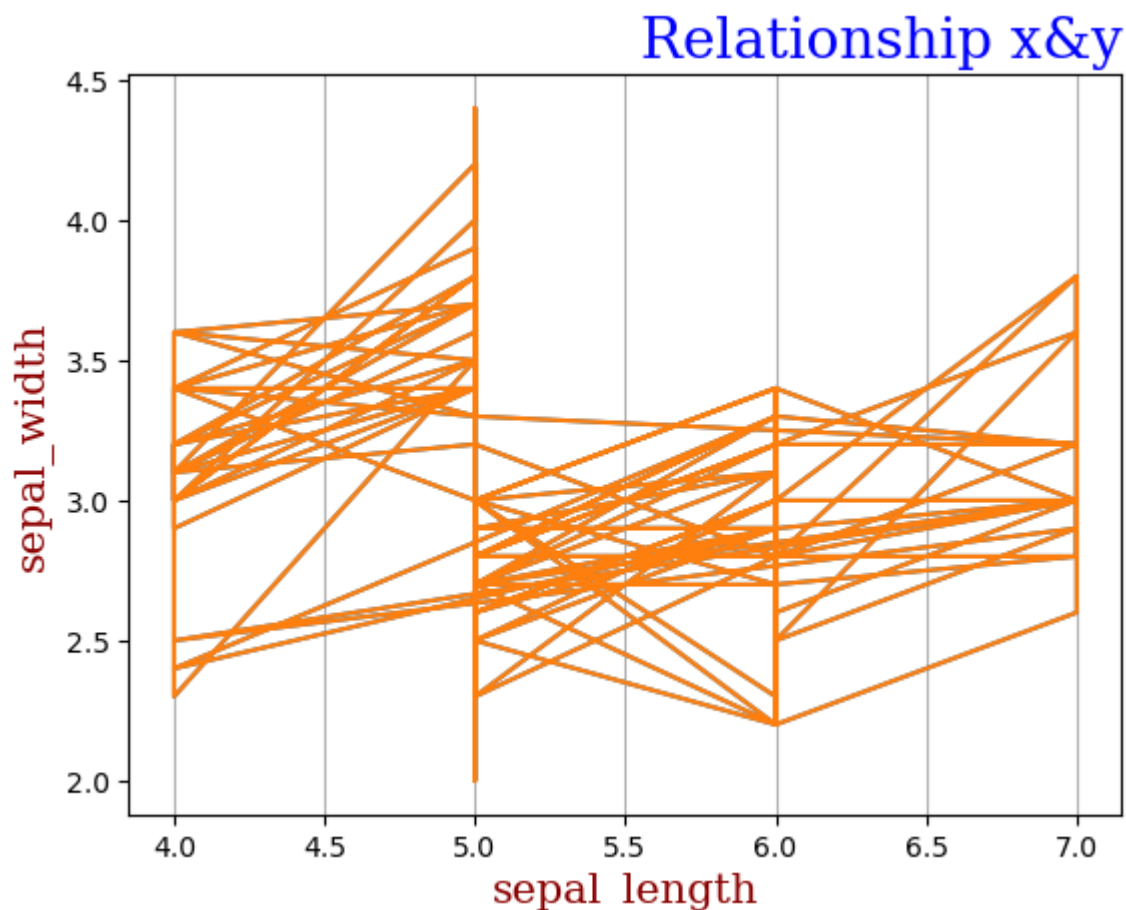
```
In [102]: x=iris['sepal.length']  
y=iris['sepal.width']  
plt.plot(x,y)  
font1={'family':'serif','color':'blue','size':20}  
font2={'family':'serif','color':'darkred','size':15}  
plt.title("Relationship x&y",loc='right',fontdict=font1)  
plt.xlabel("sepal_length",fontdict=font2)  
plt.ylabel("sepal_width",fontdict=font2)  
plt.show()
```



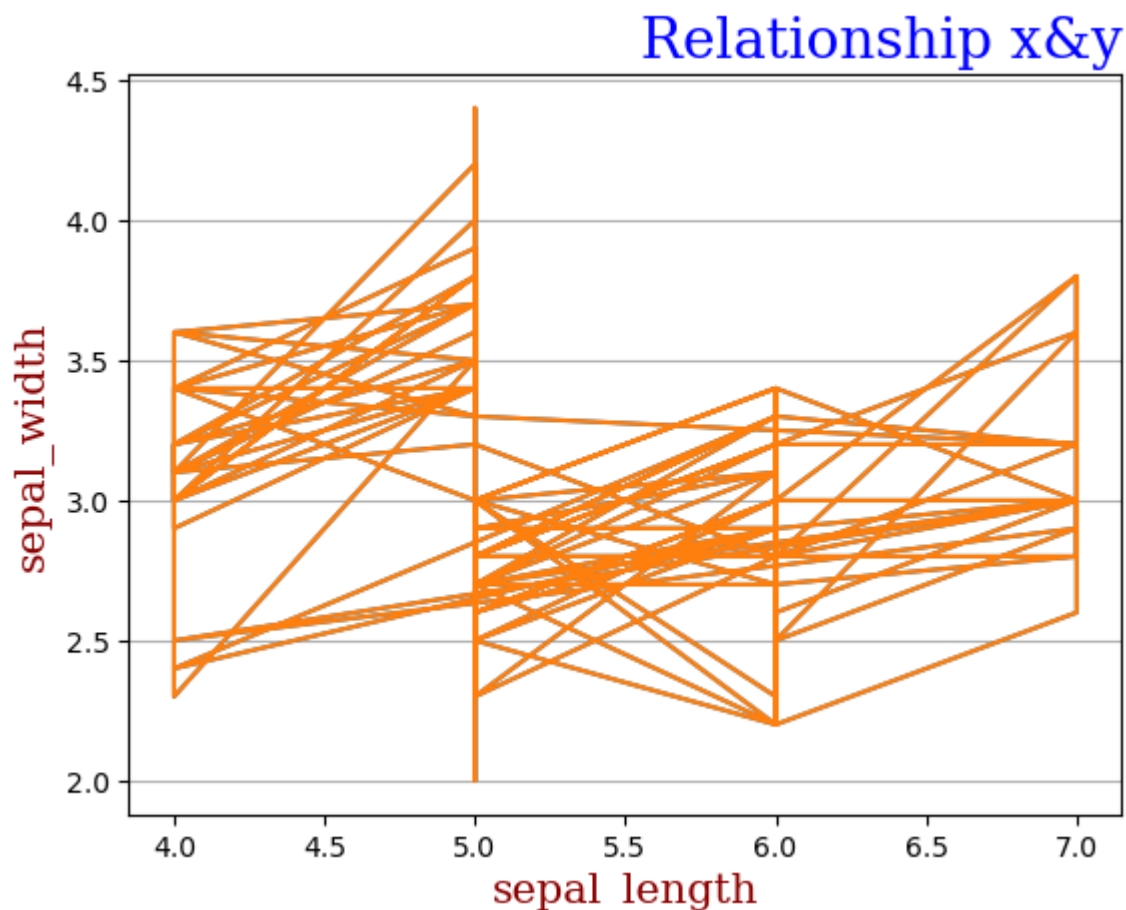
```
In [103]: x=iris['sepal.length']
y=iris['sepal.width']
plt.plot(x,y)
font1={'family':'serif','color':'blue','size':20}
font2={'family':'serif','color':'darkred','size':15}
plt.title("Relationship x&y",loc='right',fontdict=font1)
plt.xlabel("sepal_length",fontdict=font2)
plt.ylabel("sepal_width",fontdict=font2)
plt.plot(x,y)
plt.grid()
plt.show()
```



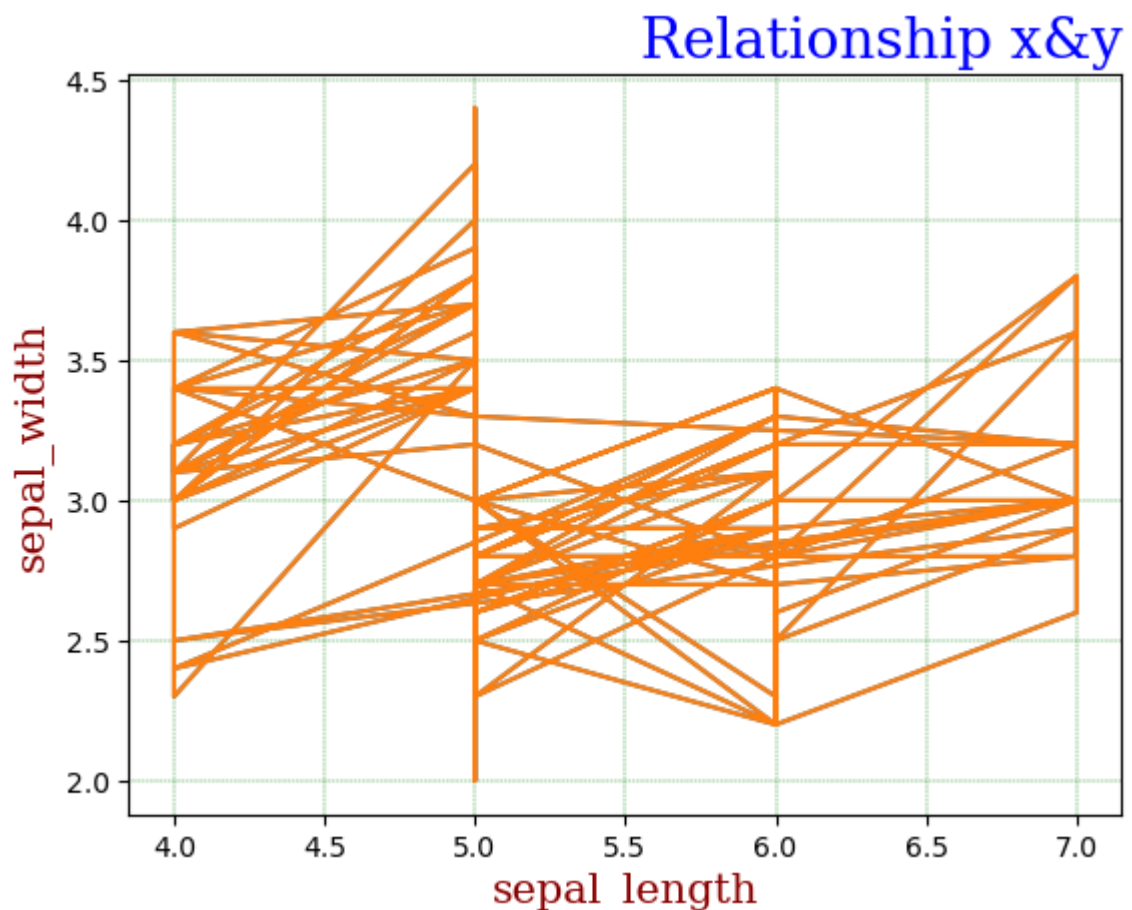
```
In [104]: x=iris['sepal.length']
y=iris['sepal.width']
plt.plot(x,y)
font1={'family':'serif','color':'blue','size':20}
font2={'family':'serif','color':'darkred','size':15}
plt.title("Relationship x&y",loc='right',fontdict=font1)
plt.xlabel("sepal_length",fontdict=font2)
plt.ylabel("sepal_width",fontdict=font2)
plt.plot(x,y)
plt.grid(axis='x')
plt.show()
```



```
In [105]: x=iris['sepal.length']  
y=iris['sepal.width']  
plt.plot(x,y)  
font1={'family':'serif','color':'blue','size':20}  
font2={'family':'serif','color':'darkred','size':15}  
plt.title("Relationship x&y",loc='right',fontdict=font1)  
plt.xlabel("sepal_length",fontdict=font2)  
plt.ylabel("sepal_width",fontdict=font2)  
plt.plot(x,y)  
plt.grid(axis='y')  
plt.show()
```



```
In [106]: x=iris['sepal.length']
y=iris['sepal.width']
plt.plot(x,y)
font1={'family':'serif','color':'blue','size':20}
font2={'family':'serif','color':'darkred','size':15}
plt.title("Relationship x&y",loc='right',fontdict=font1)
plt.xlabel("sepal_length",fontdict=font2)
plt.ylabel("sepal_width",fontdict=font2)
plt.plot(x,y)
plt.grid(color='green',linestyle='--',linewidth=0.3)
plt.show()
```

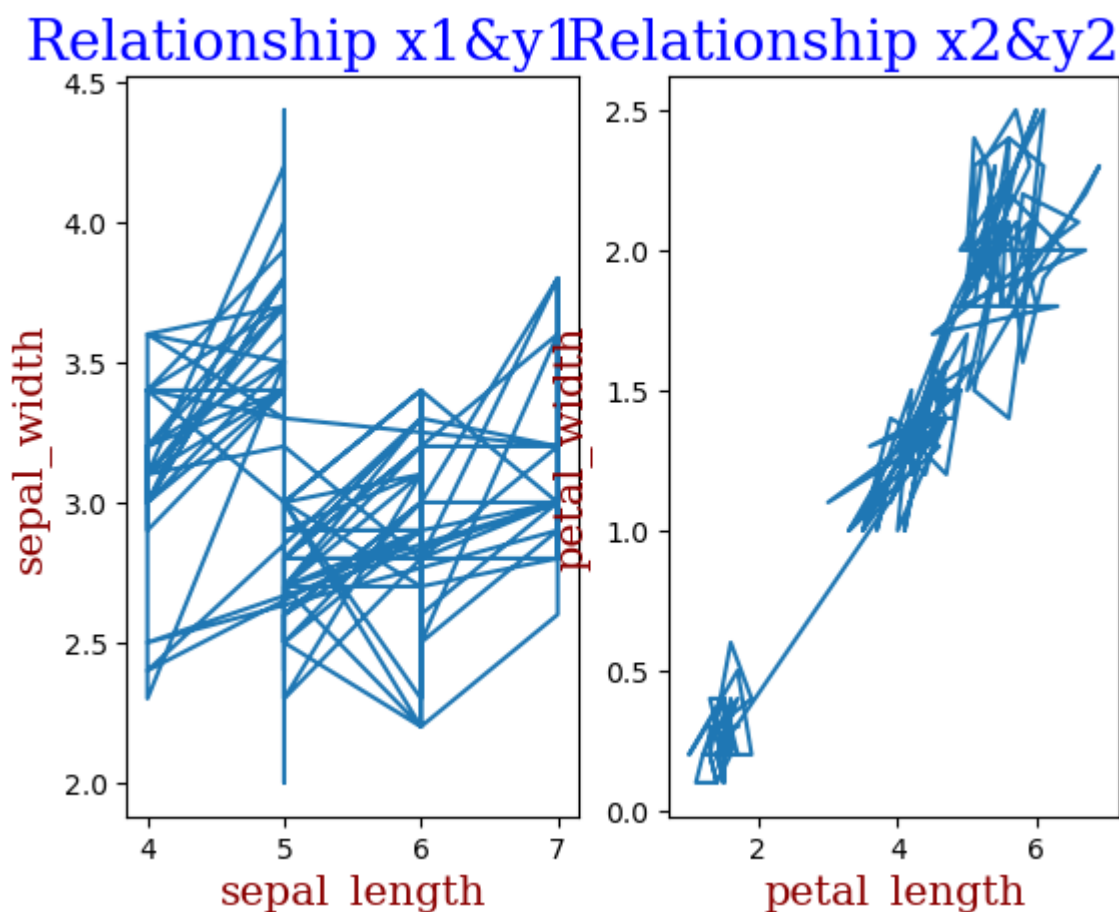


```
In [107]: iris.head()
```

```
Out[107]:
```

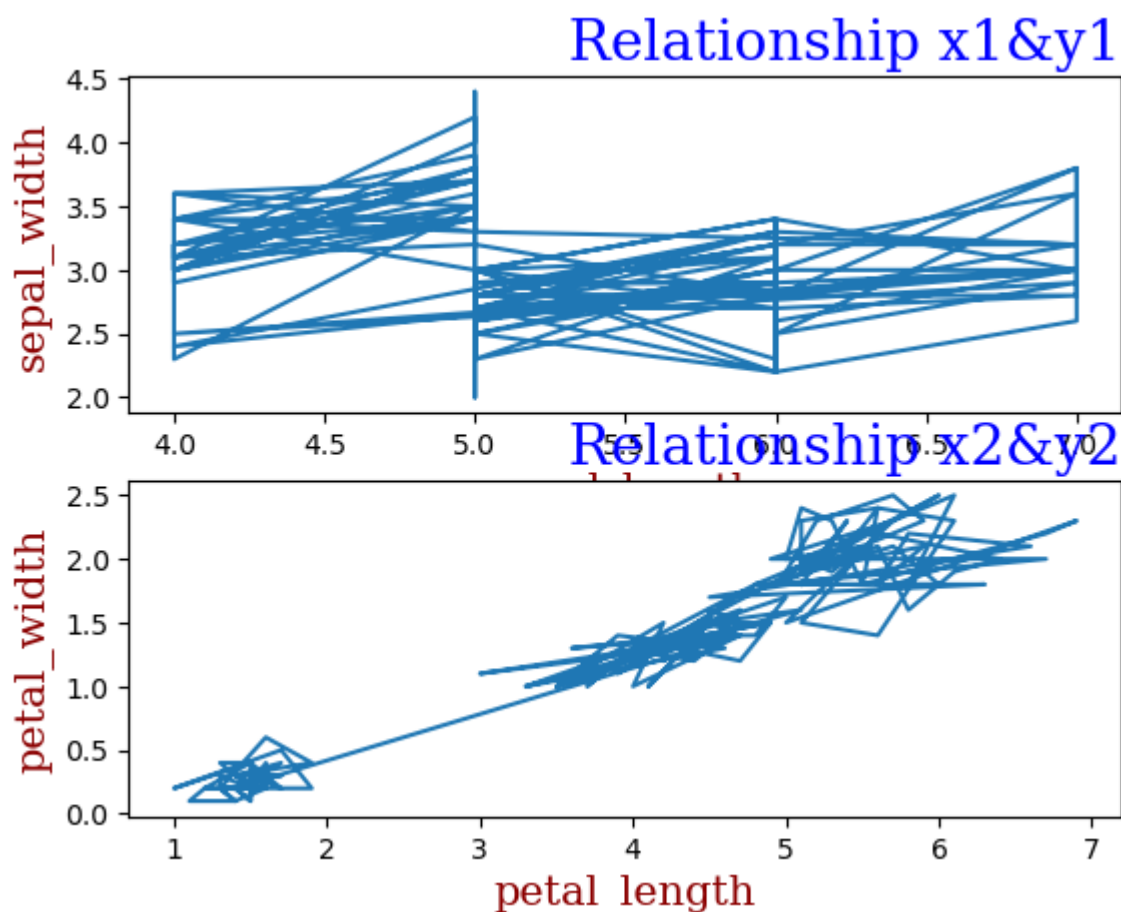
	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.0	3.5	1.4	0.2	Setosa
1	4.0	3.0	1.4	0.2	Setosa
2	4.0	3.2	1.3	0.2	Setosa
3	4.0	3.1	1.5	0.2	Setosa
4	5.0	3.6	1.4	0.2	Setosa

```
In [122]: font1={'family':'serif','color':'blue','size':20}
font2={'family':'serif','color':'darkred','size':15}
# plot 1
x1=iris['sepal.length']
y1=iris['sepal.width']
plt.subplot(1,2,1)
plt.plot(x1,y1)
plt.title("Relationship x1&y1",loc='right',fontdict=font1)
plt.xlabel("sepal_length",fontdict=font2)
plt.ylabel("sepal_width",fontdict=font2)
# plot2
x2=iris['petal.length']
y2=iris['petal.width']
plt.subplot(1,2,2)
plt.plot(x2,y2)
plt.title("Relationship x2&y2",loc='right',fontdict=font1)
plt.xlabel("petal_length",fontdict=font2)
plt.ylabel("petal_width",fontdict=font2)
plt.show()
```



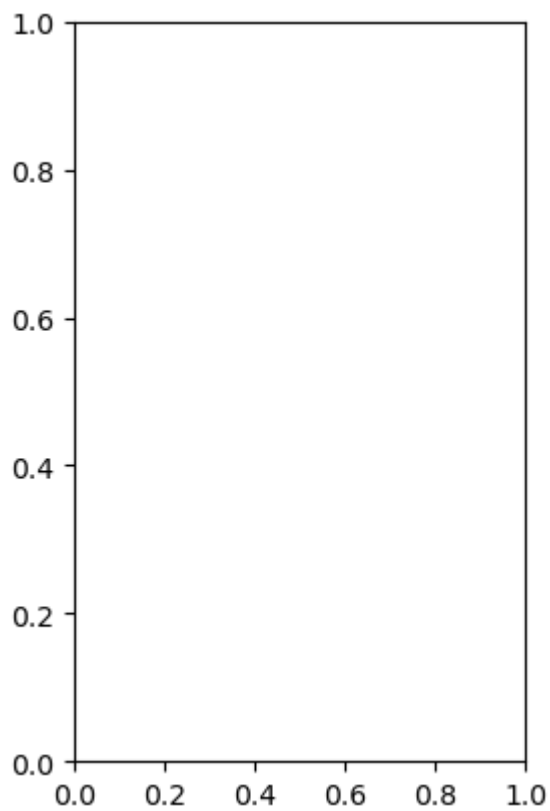


```
In [125]: font1={'family':'serif','color':'blue','size':20}
font2={'family':'serif','color':'darkred','size':15}
# plot 1
x1=iris['sepal.length']
y1=iris['sepal.width']
plt.subplot(2,1,1)
plt.plot(x1,y1)
plt.title("Relationship x1&y1",loc='right',fontdict=font1)
plt.xlabel("sepal_length",fontdict=font2)
plt.ylabel("sepal_width",fontdict=font2)
# plot2
x2=iris['petal.length']
y2=iris['petal.width']
plt.subplot(2,1,2)
plt.plot(x2,y2)
plt.title("Relationship x2&y2",loc='right',fontdict=font1)
plt.xlabel("petal_length",fontdict=font2)
plt.ylabel("petal_width",fontdict=font2)
plt.show()
```



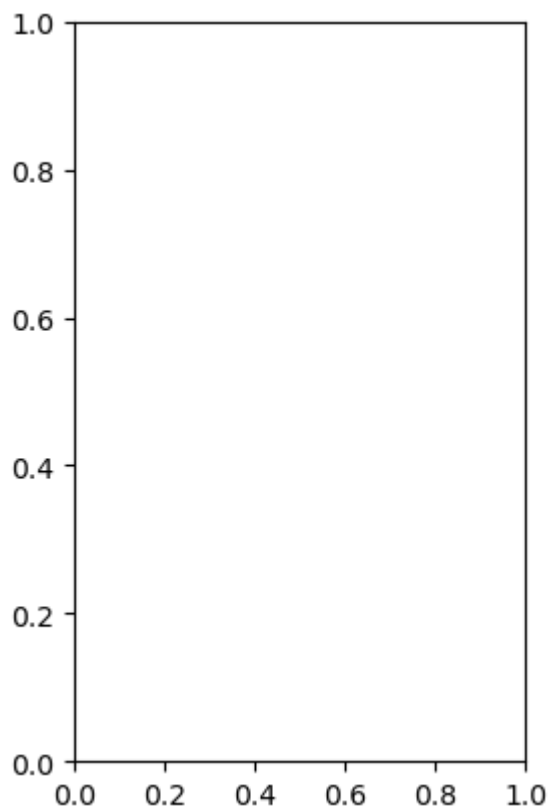
```
In [123]: plt.subplot(1,2,1)
```

```
Out[123]: <AxesSubplot:>
```



```
In [124]: plt.subplot(1,2,2)
```

```
Out[124]: <AxesSubplot:>
```

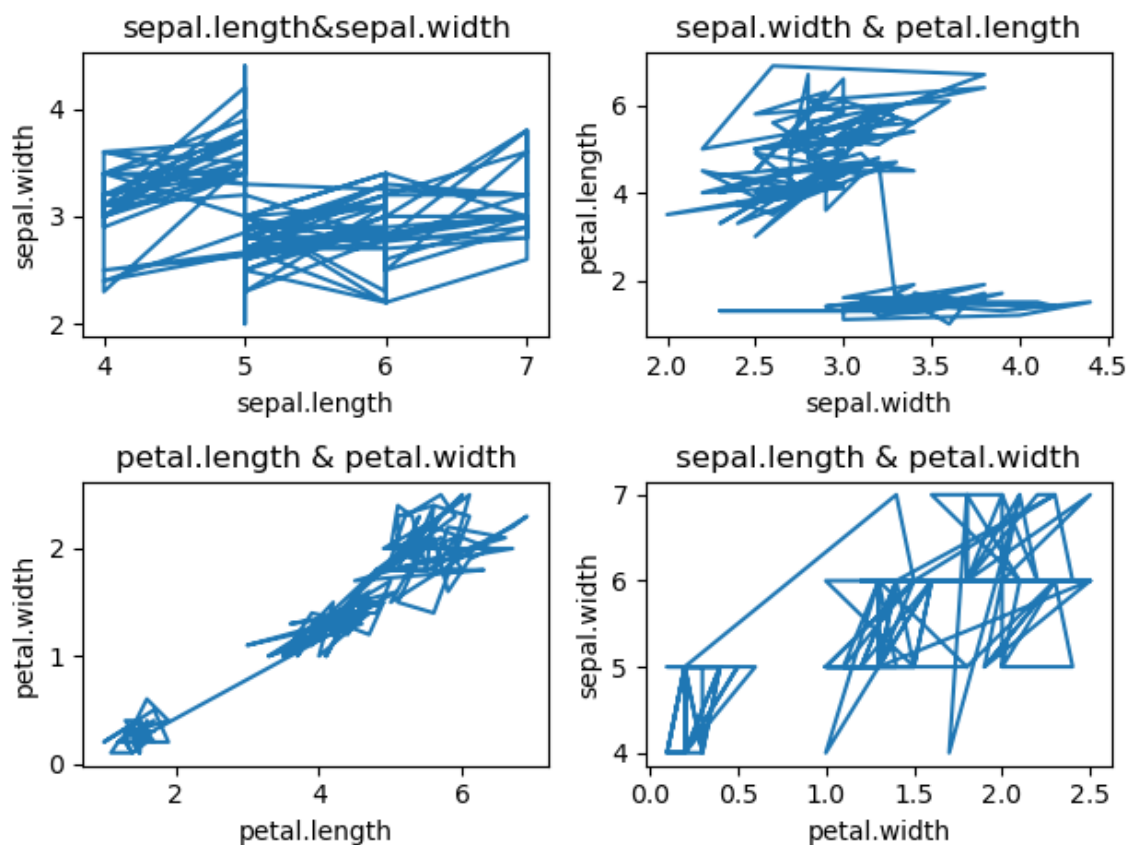


```
In [126]: iris.head(2)
```

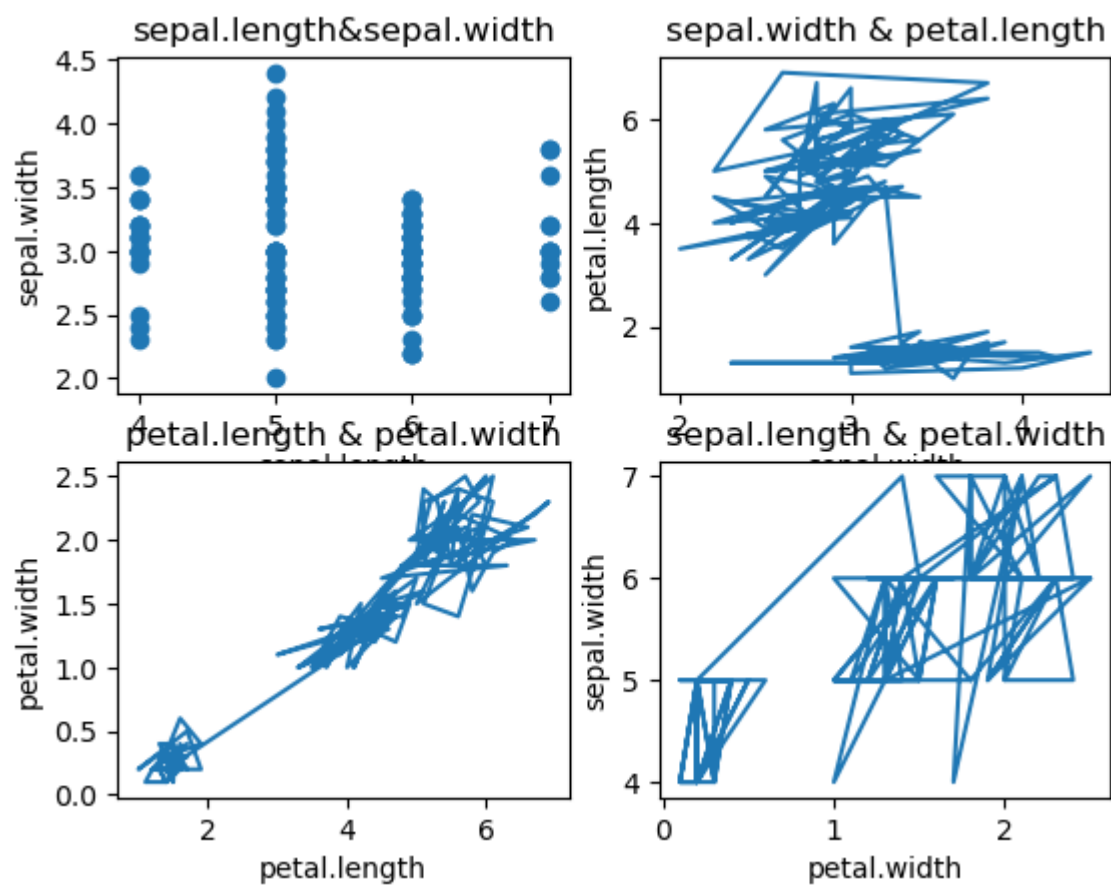
Out[126]:

	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.0	3.5	1.4	0.2	Setosa
1	4.0	3.0	1.4	0.2	Setosa

```
In [153]: import numpy as np
import matplotlib.pyplot as plt
#1
x1=iris['sepal.length']
y1=iris['sepal.width']
plt.subplot(2,2,1)
plt.plot(x1,y1)
plt.title("sepal.length&sepal.width")
plt.xlabel("sepal.length")
plt.ylabel("sepal.width")
#2
x2=iris['sepal.width']
y2=iris['petal.length']
plt.subplot(2,2,2)
plt.plot(x2,y2)
plt.title("sepal.width & petal.length")
plt.xlabel("sepal.width")
plt.ylabel("petal.length")
#3
x3=iris['petal.length']
y3=iris['petal.width']
plt.subplot(2,2,3)
plt.plot(x3,y3)
plt.title("petal.length & petal.width")
plt.xlabel("petal.length")
plt.ylabel("petal.width")
#4
x4=iris['petal.width']
y4=iris['sepal.length']
plt.subplot(2,2,4)
plt.plot(x4,y4)
plt.title("sepal.length & petal.width")
plt.xlabel("petal.width")
plt.ylabel("sepal.width")
plt.tight_layout()
plt.show()
```

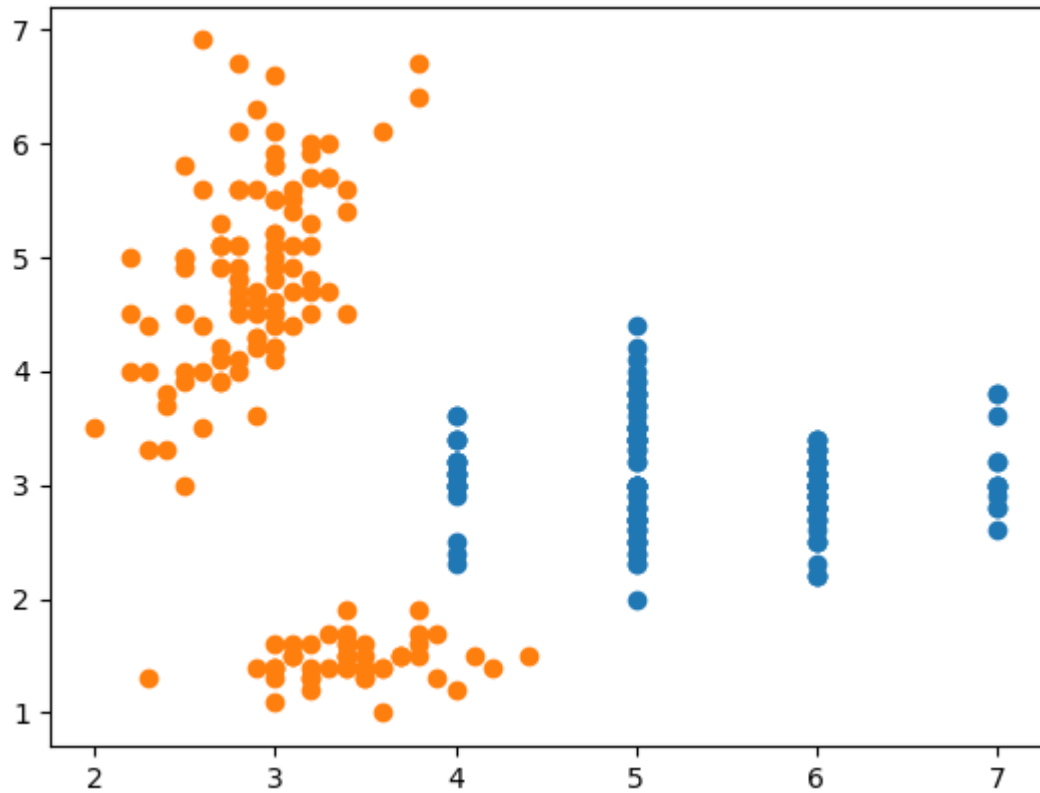


```
In [155]: import numpy as np
import matplotlib.pyplot as plt
#1
x1=iris['sepal.length']
y1=iris['sepal.width']
plt.subplot(2,2,1)
plt.scatter(x1,y1)
plt.title("sepal.length&sepal.width")
plt.xlabel("sepal.length")
plt.ylabel("sepal.width")
#2
x2=iris['sepal.width']
y2=iris['petal.length']
plt.subplot(2,2,2)
plt.plot(x2,y2)
plt.title("sepal.width & petal.length")
plt.xlabel("sepal.width")
plt.ylabel("petal.length")
#3
x3=iris['petal.length']
y3=iris['petal.width']
plt.subplot(2,2,3)
plt.plot(x3,y3)
plt.title("petal.length & petal.width")
plt.xlabel("petal.length")
plt.ylabel("petal.width")
#4
x4=iris['petal.width']
y4=iris['sepal.length']
plt.subplot(2,2,4)
plt.plot(x4,y4)
plt.title("sepal.length & petal.width")
plt.xlabel("petal.width")
plt.ylabel("sepal.width")
plt.show()
```



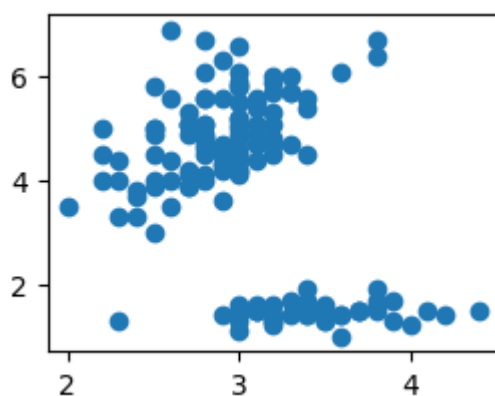
```
In [156]: x=iris['sepal.length']  
y=iris['sepal.width']  
plt.scatter(x,y)  
#2  
x=iris['sepal.width']  
y=iris['petal.length']  
plt.scatter(x,y)
```

Out[156]: <matplotlib.collections.PathCollection at 0x274517bfac0>





```
In [157]: x=iris['sepal.length']
y=iris['sepal.width']
plt.scatter(x,y)
#2
x=iris['sepal.width']
y=iris['petal.length']
plt.scatter(x,y)
#3
x3=iris['petal.length']
y3=iris['petal.width']
plt.scatter(x,y)
#4
x4=iris['petal.width']
y4=iris['sepal.length']
plt.subplot(2,2,4)
plt.scatter(x,y)
plt.show()
```



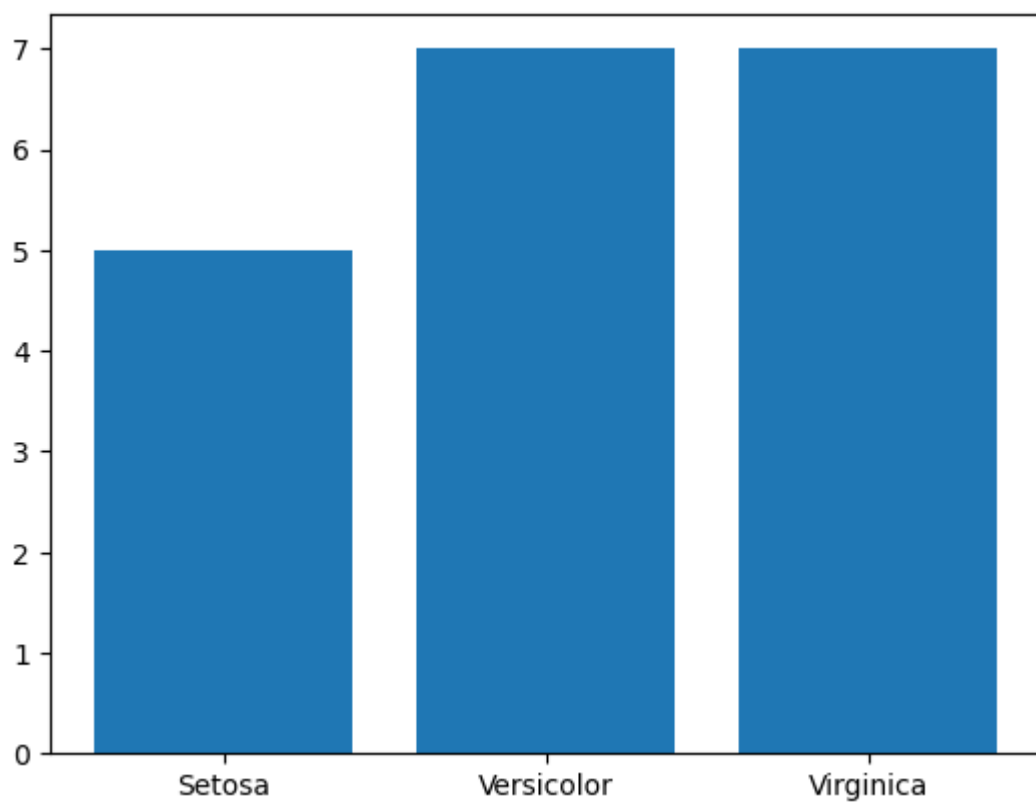
```
In [159]: iris.head(2)
```

```
Out[159]:
```

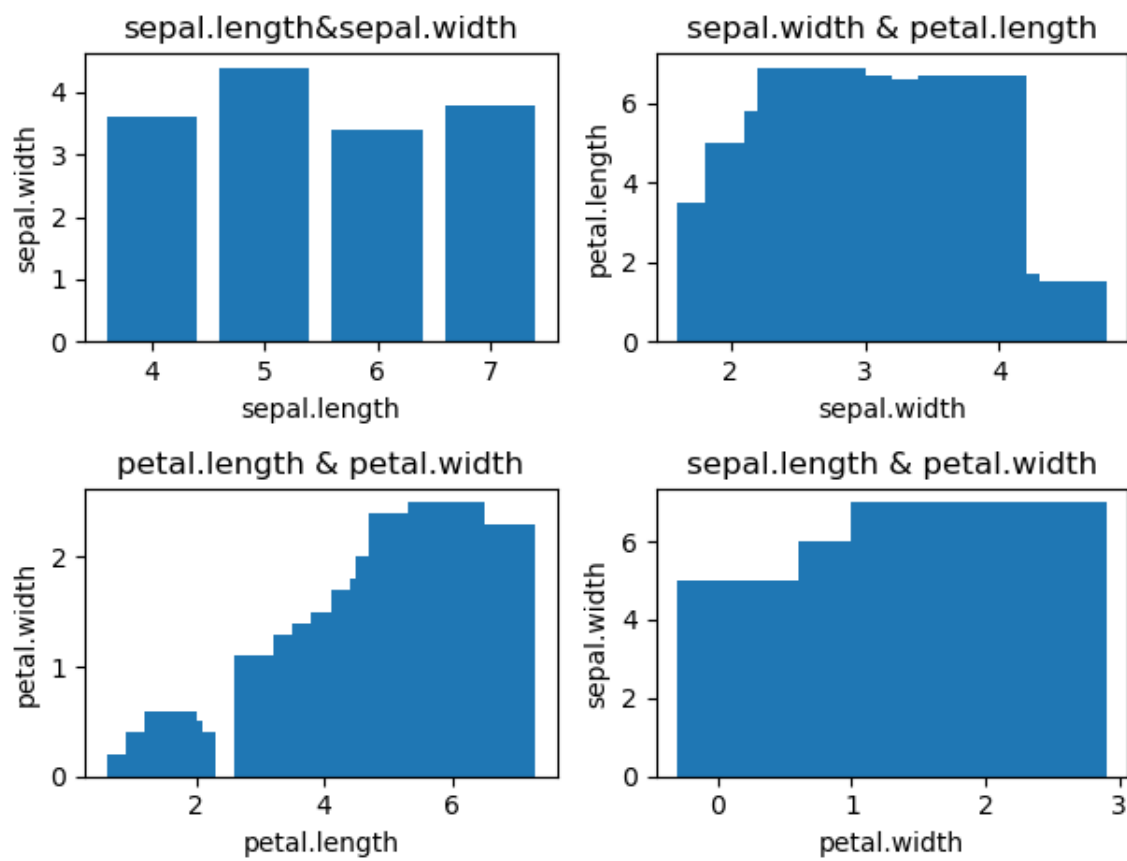
	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.0	3.5	1.4	0.2	Setosa
1	4.0	3.0	1.4	0.2	Setosa

```
In [167]: x=iris['variety']  
y=iris['sepal.length']  
plt.bar(x,y)
```

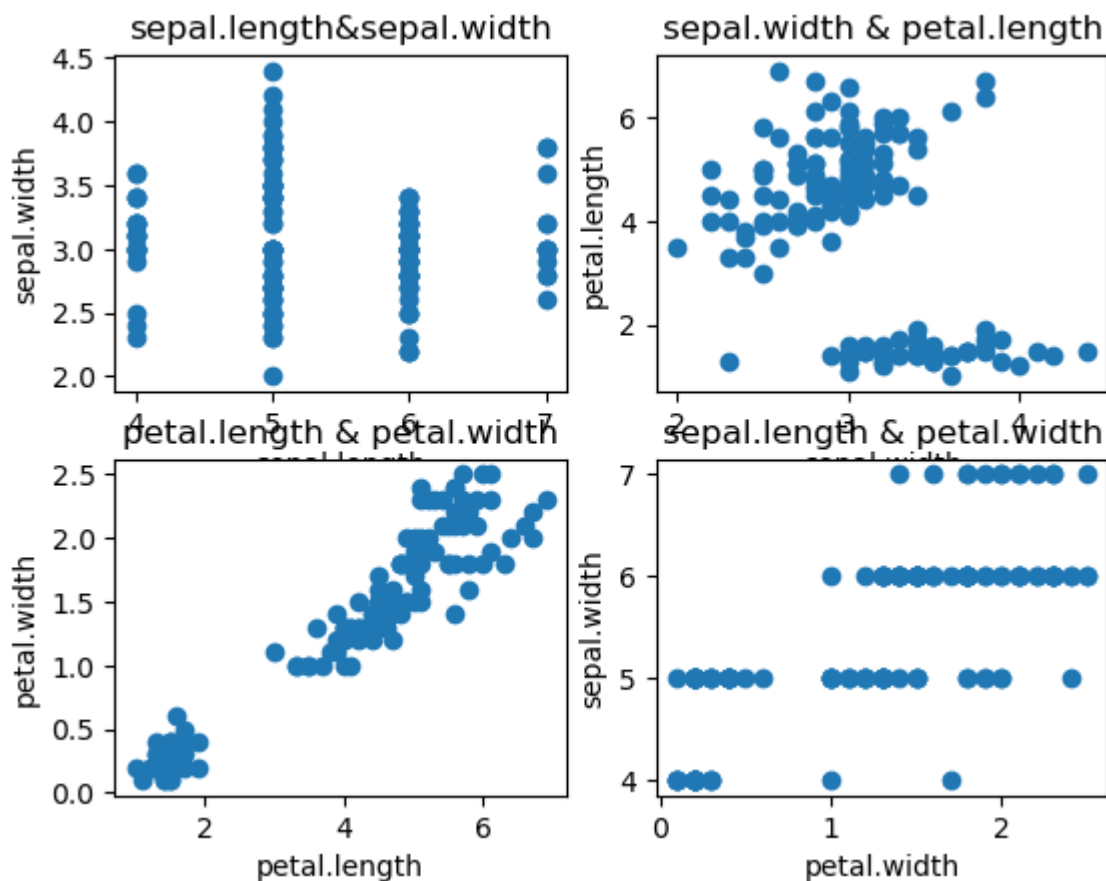
Out[167]: <BarContainer object of 150 artists>



```
In [162]: import numpy as np
import matplotlib.pyplot as plt
#1
x1=iris['sepal.length']
y1=iris['sepal.width']
plt.subplot(2,2,1)
plt.bar(x1,y1)
plt.title("sepal.length&sepal.width")
plt.xlabel("sepal.length")
plt.ylabel("sepal.width")
#2
x2=iris['sepal.width']
y2=iris['petal.length']
plt.subplot(2,2,2)
plt.bar(x2,y2)
plt.title("sepal.width & petal.length")
plt.xlabel("sepal.width")
plt.ylabel("petal.length")
#3
x3=iris['petal.length']
y3=iris['petal.width']
plt.subplot(2,2,3)
plt.bar(x3,y3)
plt.title("petal.length & petal.width")
plt.xlabel("petal.length")
plt.ylabel("petal.width")
#4
x4=iris['petal.width']
y4=iris['sepal.length']
plt.subplot(2,2,4)
plt.bar(x4,y4)
plt.title("sepal.length & petal.width")
plt.xlabel("petal.width")
plt.ylabel("sepal.width")
plt.tight_layout()
plt.show()
```



```
In [163]: import numpy as np
import matplotlib.pyplot as plt
#1
x1=iris['sepal.length']
y1=iris['sepal.width']
plt.subplot(2,2,1)
plt.scatter(x1,y1)
plt.title("sepal.length&sepal.width")
plt.xlabel("sepal.length")
plt.ylabel("sepal.width")
#2
x2=iris['sepal.width']
y2=iris['petal.length']
plt.subplot(2,2,2)
plt.scatter(x2,y2)
plt.title("sepal.width & petal.length")
plt.xlabel("sepal.width")
plt.ylabel("petal.length")
#3
x3=iris['petal.length']
y3=iris['petal.width']
plt.subplot(2,2,3)
plt.scatter(x3,y3)
plt.title("petal.length & petal.width")
plt.xlabel("petal.length")
plt.ylabel("petal.width")
#4
x4=iris['petal.width']
y4=iris['sepal.length']
plt.subplot(2,2,4)
plt.scatter(x4,y4)
plt.title("sepal.length & petal.width")
plt.xlabel("petal.width")
plt.ylabel("sepal.width")
plt.show()
```

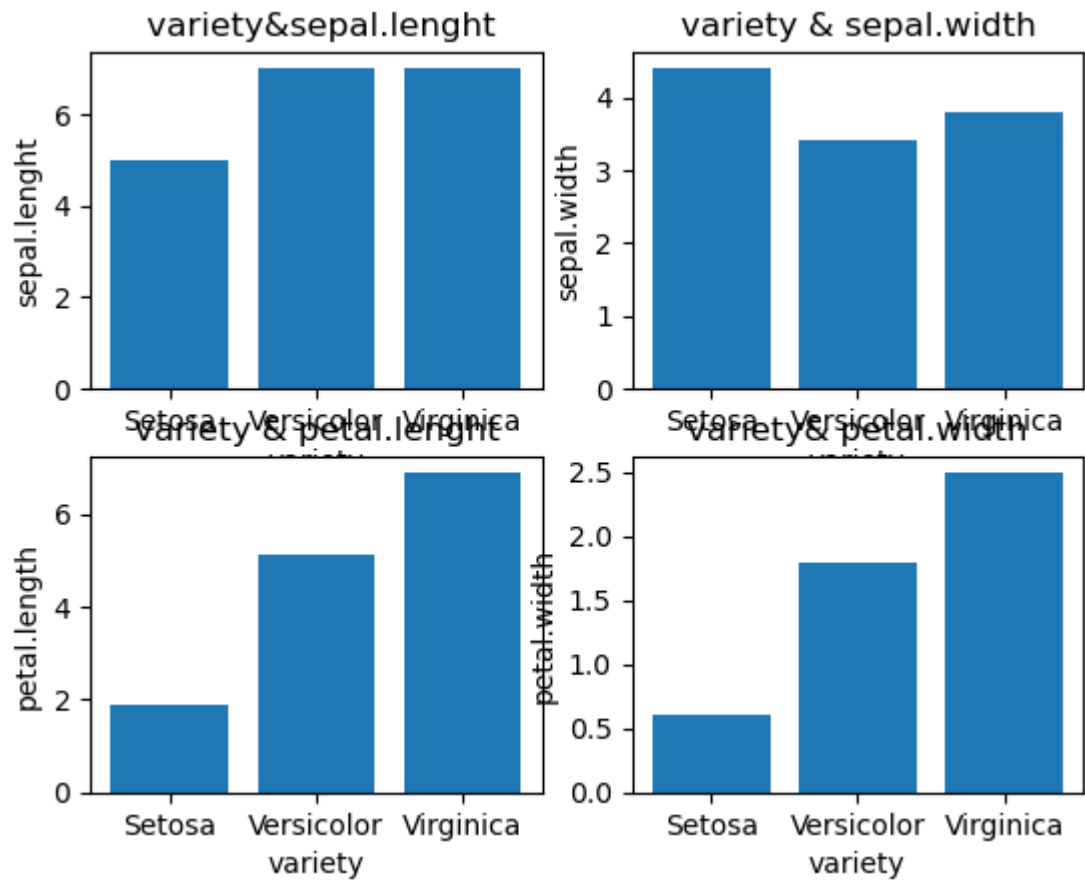


```
In [164]: iris.head(2)      19 #3
          20 x3=iris['variety']
          ---> 21 y3=iris['petal.length']
          22 plt.subplot(2,2,3)
          23 plt.plot(x3,y3)
```

```
Out[164]:
```

	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.0	3.5	1.4	0.2	Setosa
1	4.0	3.0	1.4	0.2	Setosa

```
In [168]: import numpy as np
import matplotlib.pyplot as plt
#1
x1=iris['variety']
y1=iris['sepal.length']
plt.subplot(2,2,1)
plt.bar(x1,y1)
plt.title(" variety&sepal.lenght")
plt.xlabel("variety")
plt.ylabel("sepal.lenght")
#2
x2=iris['variety']
y2=iris['sepal.width']
plt.subplot(2,2,2)
plt.bar(x2,y2)
plt.title("variety & sepal.width")
plt.xlabel("variety")
plt.ylabel("sepal.width")
#3
x3=iris['variety']
y3=iris['petal.length']
plt.subplot(2,2,3)
plt.bar(x3,y3)
plt.title("variety & petal.lenght")
plt.xlabel("variety")
plt.ylabel("petal.length")
#4
x4=iris['variety']
y4=iris['petal.width']
plt.subplot(2,2,4)
plt.bar(x4,y4)
plt.title("variety& petal.width")
plt.xlabel("variety")
plt.ylabel("petal.width")
plt.show()
```

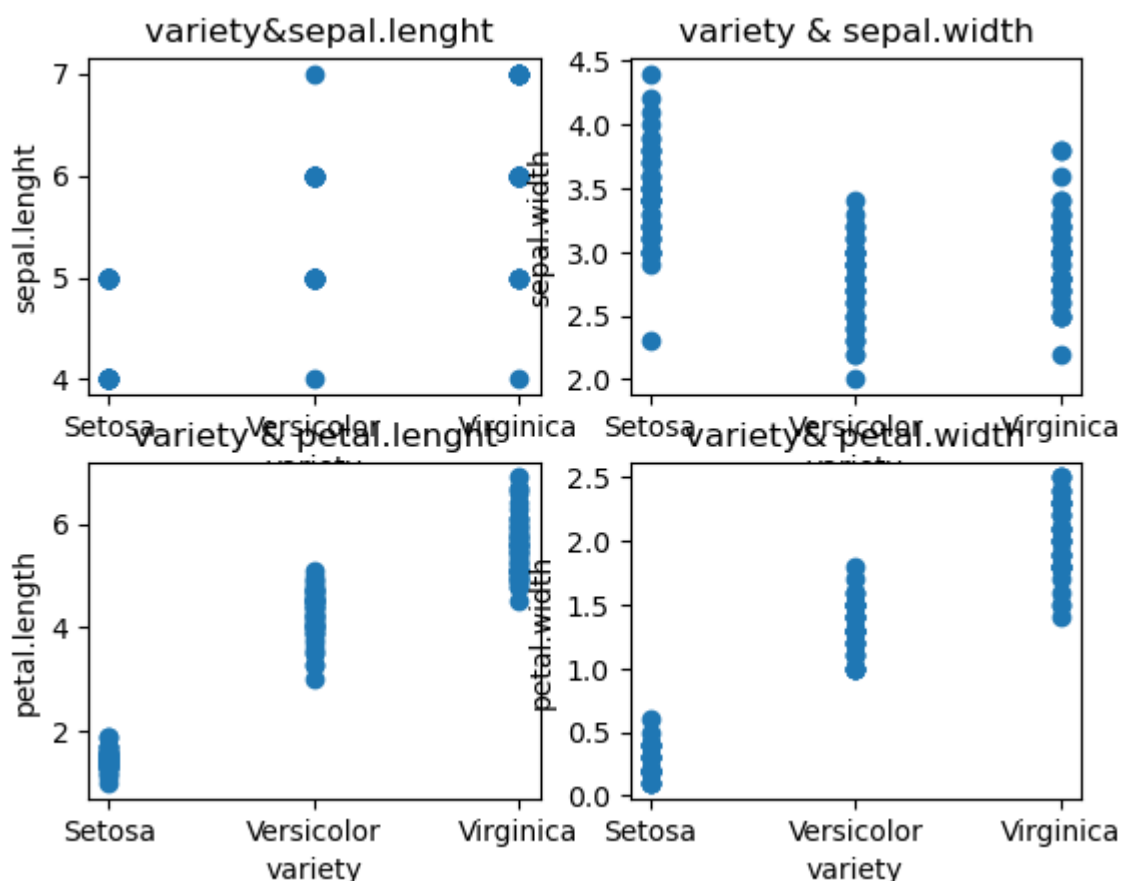




```

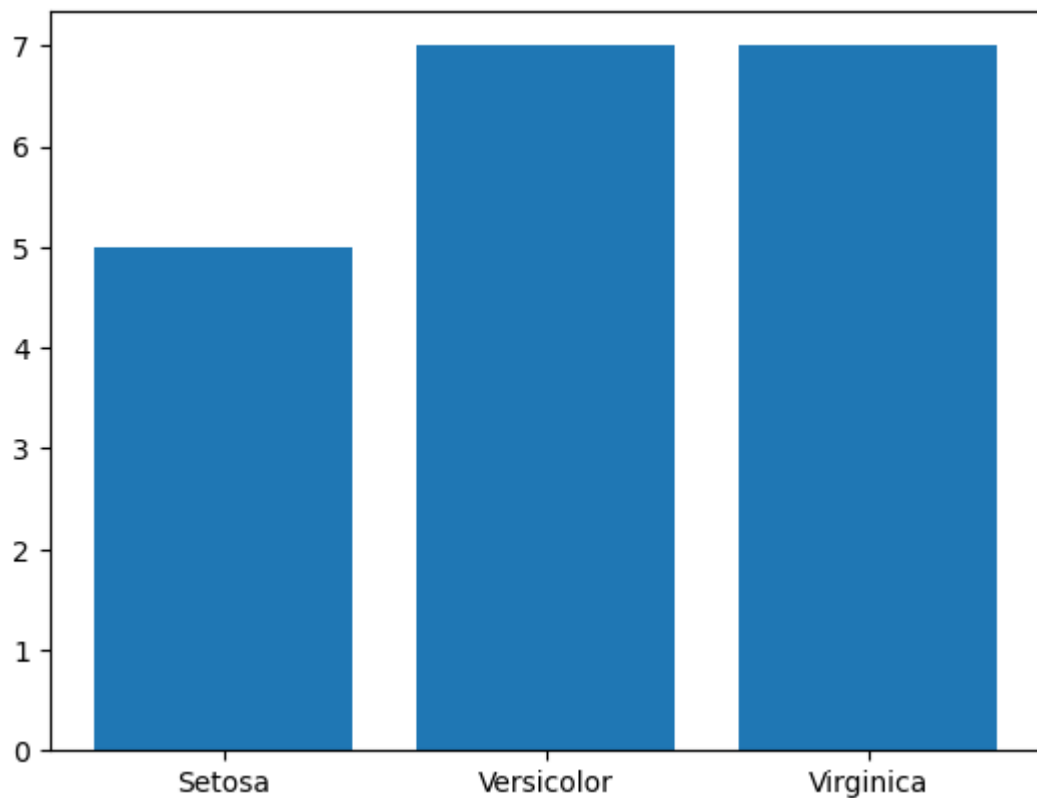
In [169]: x1=iris['variety']
y1=iris['sepal.length']
plt.subplot(2,2,1)
plt.scatter(x1,y1)
plt.title(" variety&sepal.lenght")
plt.xlabel("variety")
plt.ylabel("sepal.length")
#2
x2=iris['variety']
y2=iris['sepal.width']
plt.subplot(2,2,2)
plt.scatter(x2,y2)
plt.title("variety & sepal.width")
plt.xlabel("variety")
plt.ylabel("sepal.width")
#3
x3=iris['variety']
y3=iris['petal.length']
plt.subplot(2,2,3)
plt.scatter(x3,y3)
plt.title("variety & petal.lenght")
plt.xlabel("variety")
plt.ylabel("petal.length")
#4
x4=iris['variety']
y4=iris['petal.width']
plt.subplot(2,2,4)
plt.scatter(x4,y4)
plt.title("variety& petal.width")
plt.xlabel("variety")
plt.ylabel("petal.width")
plt.show()

```



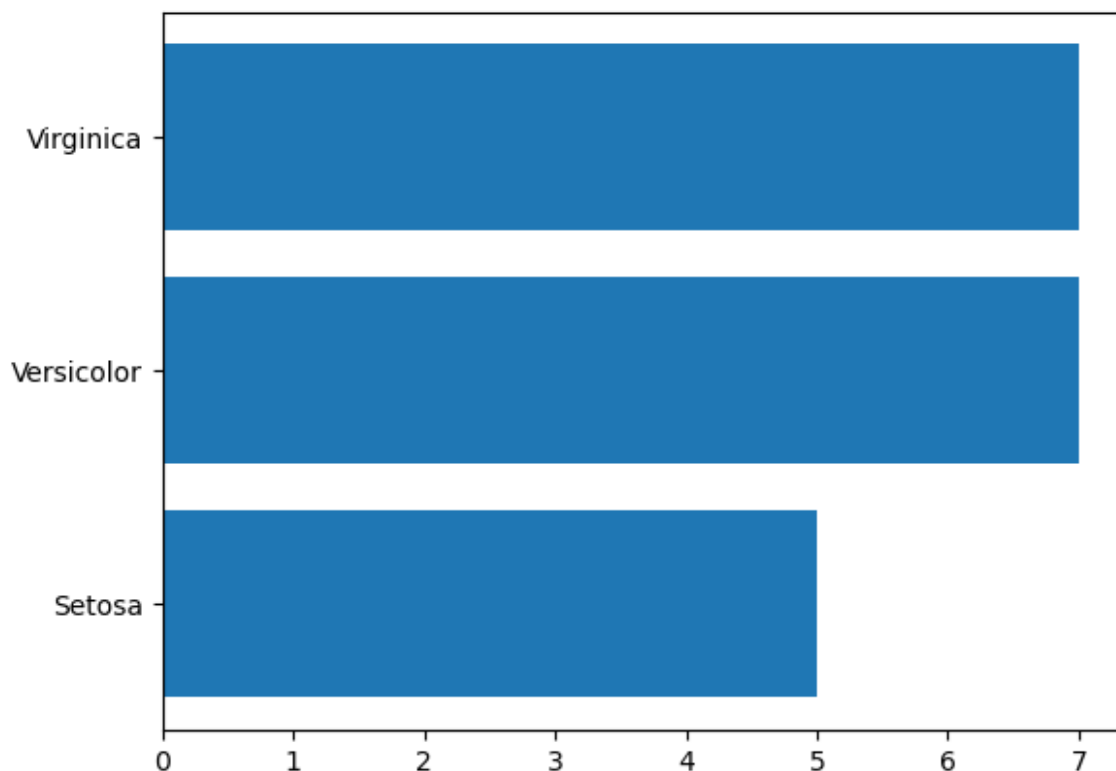
```
In [171]: y=iris['variety']  
x=iris['sepal.length']  
plt.bar(y,x)
```

Out[171]: <BarContainer object of 150 artists>



```
In [172]: x=iris['variety']  
y=iris['sepal.length']  
plt.barh(x,y)
```

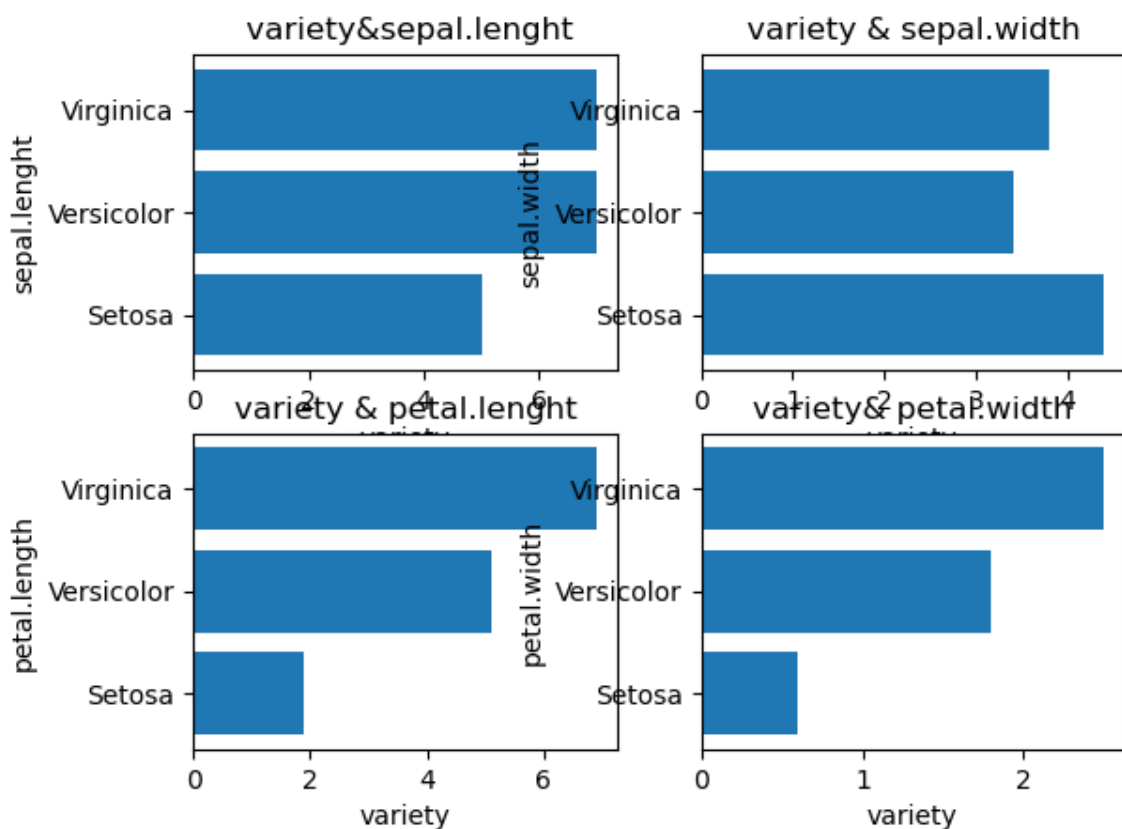
Out[172]: <BarContainer object of 150 artists>



```

In [173]: x1=iris['variety']
y1=iris['sepal.length']
plt.subplot(2,2,1)
plt.barh(x1,y1)
plt.title(" variety&sepal.lenght")
plt.xlabel("variety")
plt.ylabel("sepal.length")
#2
x2=iris['variety']
y2=iris['sepal.width']
plt.subplot(2,2,2)
plt.barh(x2,y2)
plt.title("variety & sepal.width")
plt.xlabel("variety")
plt.ylabel("sepal.width")
#3
x3=iris['variety']
y3=iris['petal.length']
plt.subplot(2,2,3)
plt.barh(x3,y3)
plt.title("variety & petal.lenght")
plt.xlabel("variety")
plt.ylabel("petal.length")
#4
x4=iris['variety']
y4=iris['petal.width']
plt.subplot(2,2,4)
plt.barh(x4,y4)
plt.title("variety& petal.width")
plt.xlabel("variety")
plt.ylabel("petal.width")
plt.show()

```



```
In [174]: import numpy as np
```

```
In [175]: x=np.random.normal(170,10,250)
```

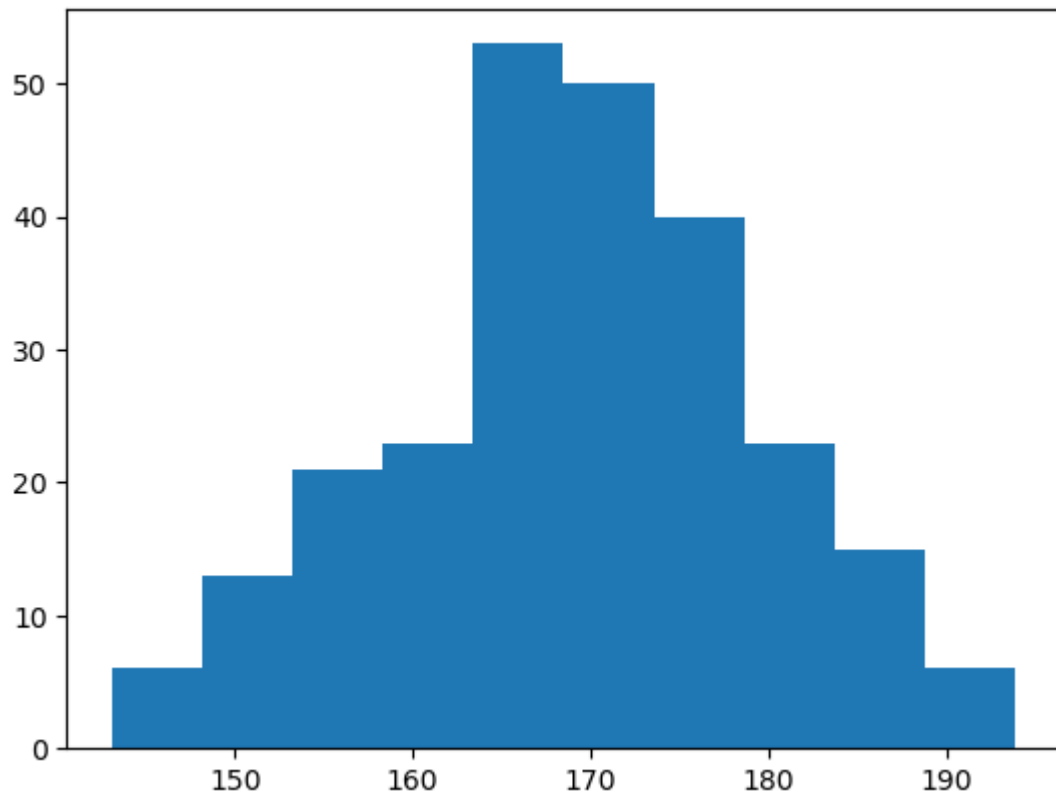
In [176]: x

```
Out[176]: array([174.32499242, 177.58260901, 169.12208683, 176.65942737,
164.80013362, 165.56982178, 150.6471947 , 193.8093882 ,
168.08523319, 170.77774422, 163.32092643, 185.49376268,
154.04858862, 171.96332998, 165.87412099, 159.03000125,
164.06640213, 167.93544901, 191.06178342, 154.6443675 ,
155.07133856, 174.44175559, 176.74219937, 173.89438486,
167.89988104, 173.63554713, 165.13625114, 169.61552711,
172.01306607, 163.36839045, 174.36730245, 164.2447312 ,
175.96104805, 168.40343194, 179.60541157, 168.38735583,
175.82980851, 165.49543059, 183.12322835, 166.99810669,
175.2919385 , 157.46513605, 163.64954988, 176.83030933,
155.56963663, 171.78537522, 169.73687851, 164.10664389,
172.62296032, 177.76447759, 181.32227893, 174.40692987,
179.87777452, 166.00374997, 172.05102699, 188.43569813,
162.68769769, 170.38496606, 151.20957532, 164.18462204,
152.12917185, 164.075573 , 178.85696847, 169.91364279,
177.27154161, 158.07890444, 157.08166034, 177.57885917,
157.21850263, 176.98338112, 168.52642657, 181.0212888 ,
167.91079343, 169.34897759, 172.7159101 , 179.46088773,
172.16654634, 154.7578871 , 160.17107564, 172.1231524 ,
163.49004451, 162.51443984, 166.90972858, 170.1798989 ,
174.6086906 , 174.82753458, 176.07390219, 166.24633234,
168.64807408, 166.24857383, 170.24283491, 185.6813409 ,
171.98226277, 162.0178169 , 154.82764963, 165.683402 ,
167.47003065, 146.0990454 , 149.5855799 , 180.68238925,
172.23691443, 176.06353289, 169.06819684, 161.45971493,
180.41360977, 143.61403125, 188.83317294, 165.12307526,
155.47491409, 171.47655344, 176.77251481, 185.00437321,
183.21380751, 143.11398922, 181.60342833, 185.08280755,
180.12123649, 166.52814831, 163.97869494, 166.46582394,
177.64362722, 171.76343547, 163.45360132, 172.58540316,
177.33827788, 152.77971645, 152.70745695, 161.69654688,
183.94107385, 170.52300822, 183.23880152, 146.23145127,
163.1076802 , 158.33880714, 167.8777881 , 161.80483176,
168.24180634, 165.19066547, 186.7975578 , 166.95779826,
177.24911829, 187.32248959, 159.12542176, 163.36013463,
174.64326048, 156.89020461, 155.94360211, 167.1470078 ,
159.57200604, 152.82865781, 179.8067886 , 176.4871483 ,
174.78933214, 161.20112711, 171.28053983, 173.46198973,
182.92082076, 153.1943785 , 188.42278455, 146.89133902,
170.56711958, 174.41487583, 153.14964591, 175.70918795,
153.94683482, 179.11355854, 180.39679181, 186.67172985,
151.93892945, 164.71100814, 177.88751604, 175.12299556,
163.86477746, 179.0701469 , 170.46797174, 170.38794364,
151.88387384, 187.25367477, 143.95031842, 175.955314 ,
183.72455251, 172.90261372, 159.26600463, 171.05583587,
158.59995553, 183.57864804, 174.05300016, 172.70548942,
168.8125569 , 191.68190337, 185.76156637, 167.20235585,
166.14948607, 173.94215919, 167.90308393, 192.07237417,
172.81644909, 149.0402546 , 173.12111431, 164.69162766,
150.69532438, 167.23826056, 157.44151756, 167.65951497,
169.21793654, 177.4901637 , 169.22654549, 172.18442249,
165.32036921, 184.55200127, 173.70430058, 162.44819279,
161.63445025, 165.21161269, 171.76431702, 172.51157224,
165.32476704, 157.06137902, 158.12659965, 170.01481205,
157.36402559, 168.01037917, 159.47899787, 157.28309053,
173.28521933, 175.0900156 , 169.83618154, 164.5973155 ,
188.42955528, 171.49188421, 180.04923582, 161.78913617,
172.28332479, 158.99711498, 174.98431902, 176.62347738,
169.61422822, 163.96838742, 179.19657656, 164.08743378,
156.49701573, 172.02976432, 166.53443153, 164.30629041,
```

```
180.26315869, 154.20059074, 170.39648437, 189.10566684,
182.20831381, 164.22550014])
```

```
In [177]: plt.hist(x)
```

```
Out[177]: (array([ 6., 13., 21., 23., 53., 50., 40., 23., 15.,  6.]),
array([143.11398922, 148.18352912, 153.25306902, 158.32260892,
        163.39214881, 168.46168871, 173.53122861, 178.60076851,
        183.6703084 , 188.7398483 , 193.8093882 ]),
<BarContainer object of 10 artists>)
```



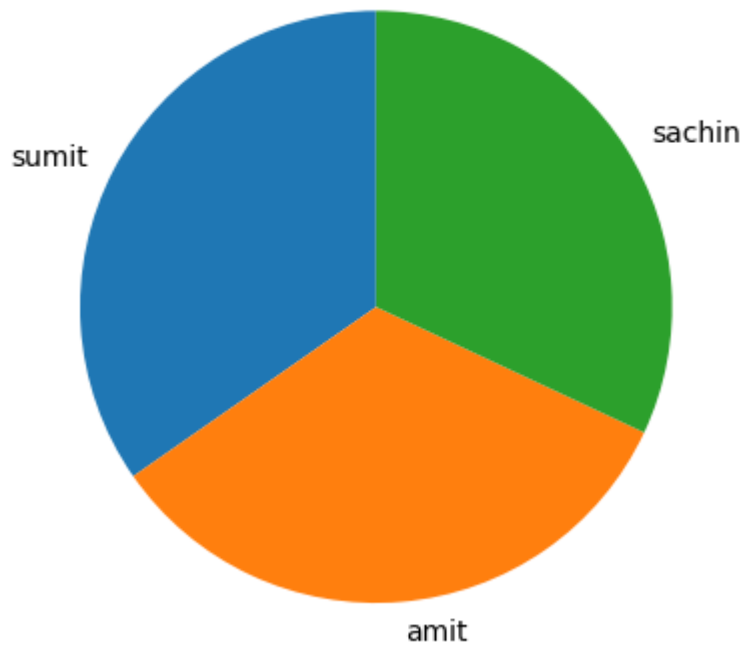
```
In [178]: iris.head(2)
```

```
Out[178]:
```

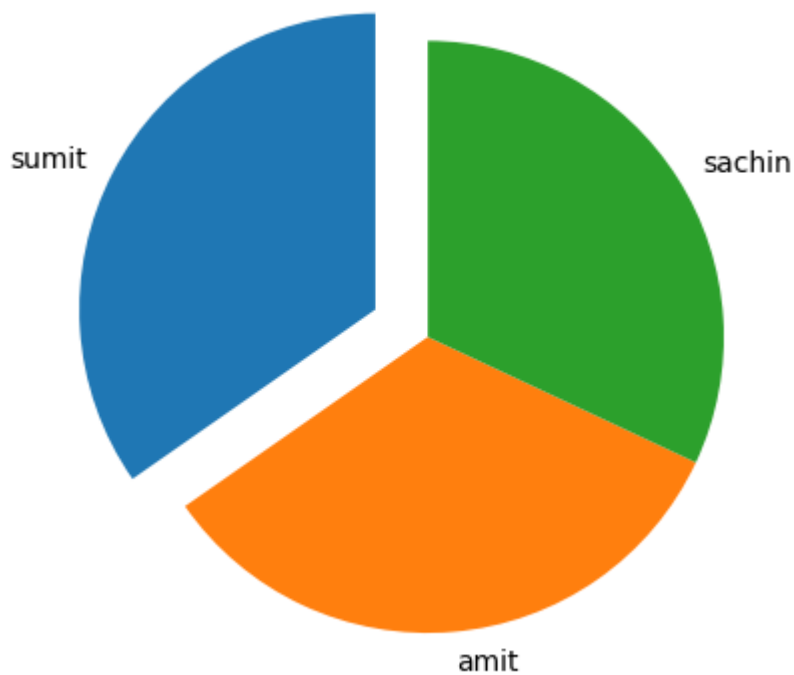
	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.0	3.5	1.4	0.2	Setosa
1	4.0	3.0	1.4	0.2	Setosa

```
In [3]: import matplotlib.pyplot as plt
import numpy as np
```

```
In [52]: y=iris['sepal.length'][:3]
mylabels=['sumit','amit','sachin']
plt.pie(y,labels=mylabels,startangle=90)
plt.show()
```

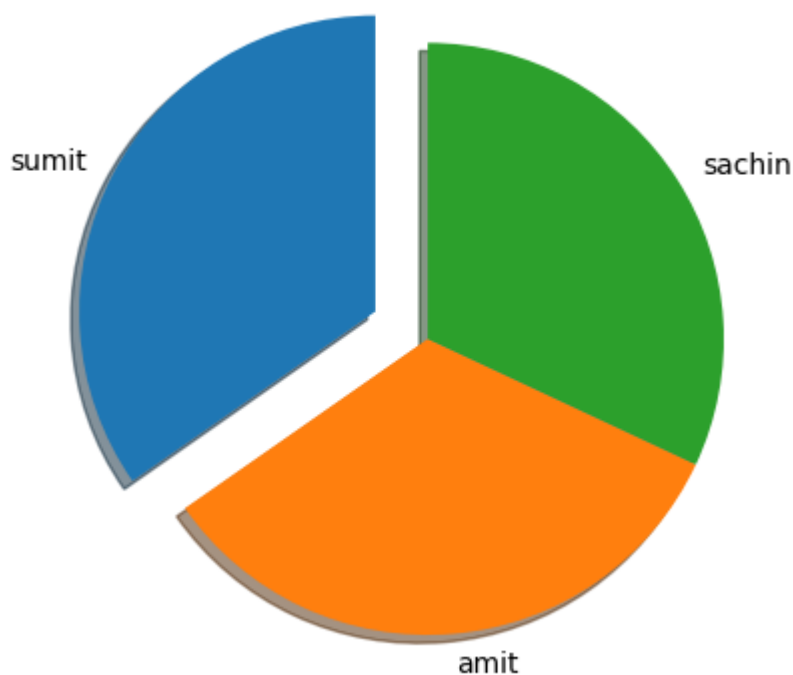


```
In [58]: y=iris['sepal.length'][:3]
mylabels=['sumit','amit','sachin']
myexplode=[0.2,0,0]
plt.pie(y,labels=mylabels,startangle=90,explode=myexplode)
plt.show()
```

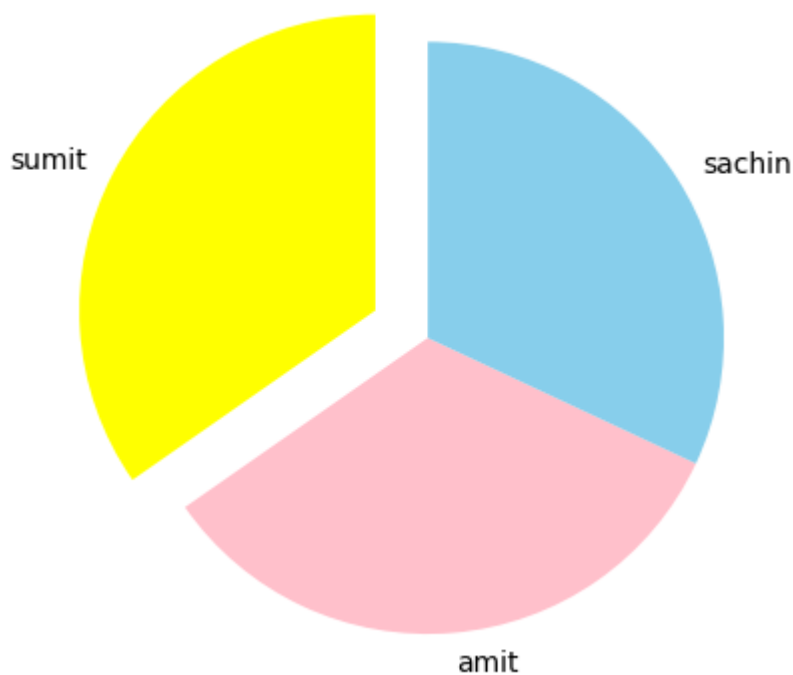




```
In [59]: y=iris['sepal.length'][:3]
mylabels=['sumit','amit','sachin']
myexplode=[0.2,0,0]
plt.pie(y,labels=mylabels,startangle=90,explode=myexplode,shadow=True)
plt.show()
```

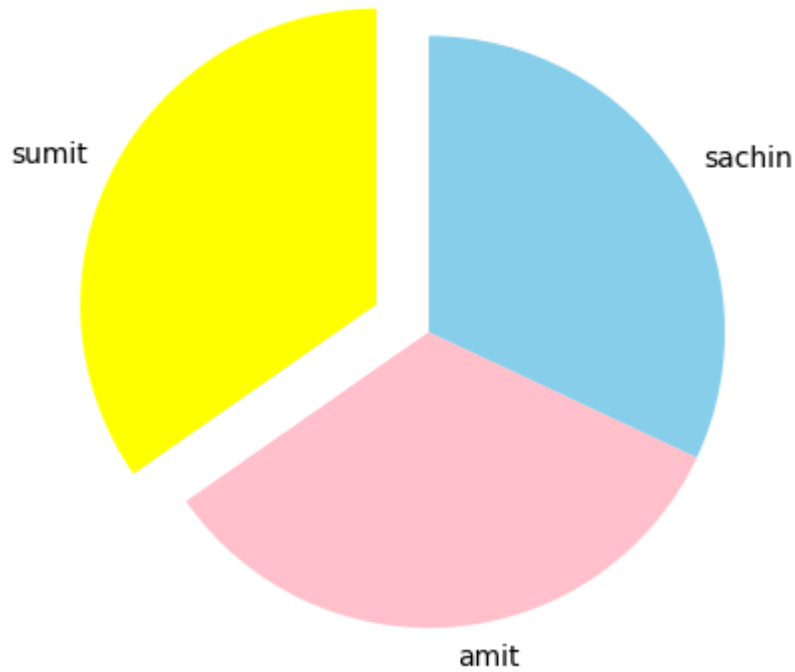


```
In [60]: y=iris['sepal.length'][:3]
mylabels=['sumit','amit','sachin']
myexplode=[0.2,0,0]
mycolors=['yellow','pink','skyblue']
plt.pie(y,labels=mylabels,startangle=90,explode=myexplode,colors=mycolors)
plt.show()
```



```
In [63]: y=iris['sepal.length'][:3]
mylabels=['sumit','amit','sachin']
myexplode=[0.2,0,0]
mycolors=['yellow','pink','skyblue']

plt.pie(y,labels=mylabels,startangle=90,explode=myexplode,colors=mycolors)
plt.show()
```



In [ ]: