

```
In [1]: import pandas as pd
import numpy as np
import seaborn as sns
```

```
In [2]: import matplotlib.pyplot as plt
```

```
In [4]: df=sns.load_dataset('iris')
```

```
In [5]: df
```

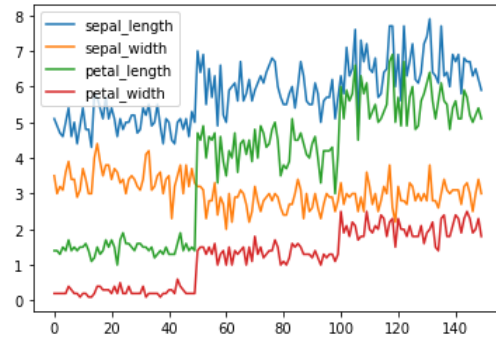
```
Out[5]:
```

	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

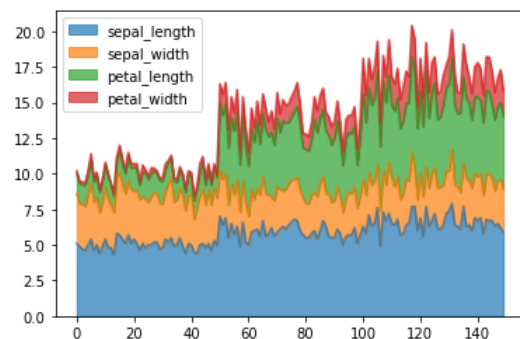
```
In [6]: #only numerical column in data set it will plot (row at x axis)
df.plot()
```

```
Out[6]: <AxesSubplot:>
```



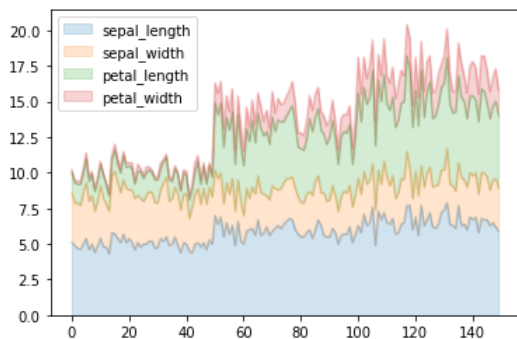
```
In [9]: #alpha is used for controlling the density of colour
df.plot(kind='area', alpha=.7)
```

```
Out[9]: <AxesSubplot:>
```



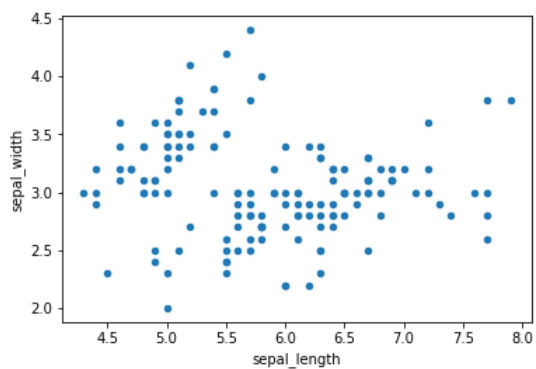
```
In [10]: df.plot(kind='area',alpha=.2)
```

```
Out[10]: <AxesSubplot:>
```



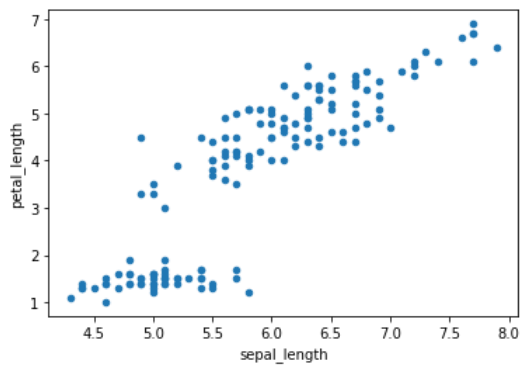
```
In [11]: df.plot.scatter(x='sepal_length',y='sepal_width')
```

```
Out[11]: <AxesSubplot:xlabel='sepal_length', ylabel='sepal_width'>
```



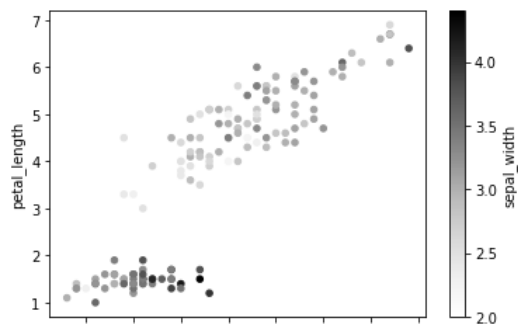
```
In [12]: df.plot.scatter(x='sepal_length',y='petal_length')
```

```
Out[12]: <AxesSubplot:xlabel='sepal_length', ylabel='petal_length'>
```



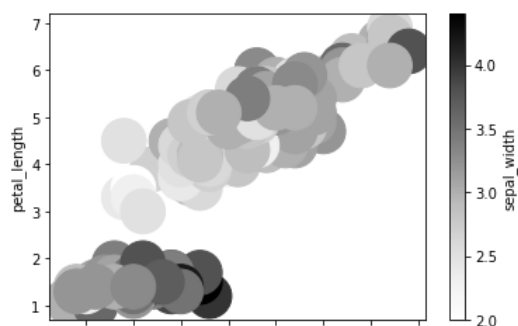
```
In [13]: # 'c' for colour of dot
df.plot.scatter(x='sepal_length',y='petal_length',c='sepal_width')
```

Out[13]: <AxesSubplot:xlabel='sepal_length', ylabel='petal_length'>



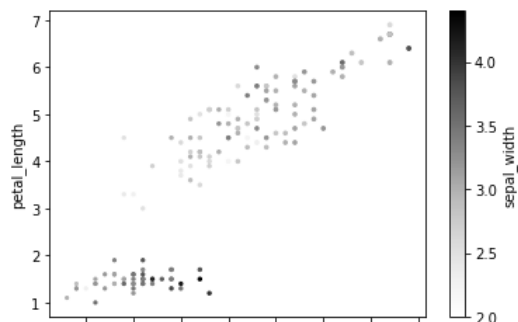
```
In [14]: # 's' size of dot
df.plot.scatter(x='sepal_length',y='petal_length',c='sepal_width',s=1000)
```

Out[14]: <AxesSubplot:xlabel='sepal_length', ylabel='petal_length'>



```
In [15]: #here 's' is dynamic one its value change on sepal_length in the example
df.plot.scatter(x='sepal_length',y='petal_length',c='sepal_width',s=df['sepal_length'])
```

Out[15]: <AxesSubplot:xlabel='sepal_length', ylabel='petal_length'>



```
In [19]: df.plot.hexbin(x='sepal_length',y='petal_length',gridsize=10,cmap='viridis')
```

Out[19]: <AxesSubplot:xlabel='sepal_length', ylabel='petal_length'>



```
In [20]: from mpl_toolkits import mplot3d
```

```
In [21]: x=np.linspace(-1,6,30)
```

```
In [22]: x
```

```
Out[22]: array([-1.          , -0.75862069, -0.51724138, -0.27586207, -0.03448276,
        0.20689655,  0.44827586,  0.68965517,  0.93103448,  1.17241379,
        1.4137931 ,  1.65517241,  1.89655172,  2.13793103,  2.37931034,
        2.62068966,  2.86206897,  3.10344828,  3.34482759,  3.5862069 ,
        3.82758621,  4.06896552,  4.31034483,  4.55172414,  4.79310345,
        5.03448276,  5.27586207,  5.51724138,  5.75862069,  6.          ])
```

```
In [23]: y=np.linspace(-1,6,30)
```

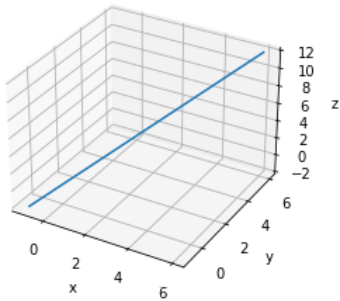
```
In [24]: z=x+y
```

```
In [25]: z
```

```
Out[25]: array([-2.          , -1.51724138, -1.03448276, -0.55172414, -0.06896552,
        0.4137931 ,  0.89655172,  1.37931034,  1.86206897,  2.34482759,
        2.82758621,  3.31034483,  3.79310345,  4.27586207,  4.75862069,
        5.24137931,  5.72413793,  6.20689655,  6.68965517,  7.17241379,
        7.65517241,  8.13793103,  8.62068966,  9.10344828,  9.5862069 ,
        10.06896552, 10.55172414, 11.03448276, 11.51724138, 12.          ])
```

```
In [33]: ax=plt.axes(projection='3d')
ax.plot3D(x,y,z)
ax.set_xlabel('x')
ax.set_ylabel('y')
ax.set_zlabel('z')
```

```
Out[33]: Text(0.5, 0, 'z')
```



```
In [34]: df
```

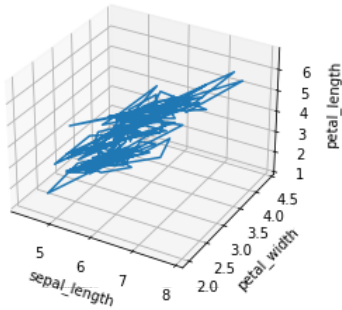
```
Out[34]:
```

	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

```
In [36]: ax=plt.axes(projection='3d')
ax.plot3D(df['sepal_length'],df['sepal_width'],df['petal_length'])
ax.set_xlabel('sepal_length')
ax.set_ylabel('petal_width')
ax.set_zlabel('petal_length')
```

Out[36]: Text(0.5, 0, 'petal_length')



```
In [37]: df
```

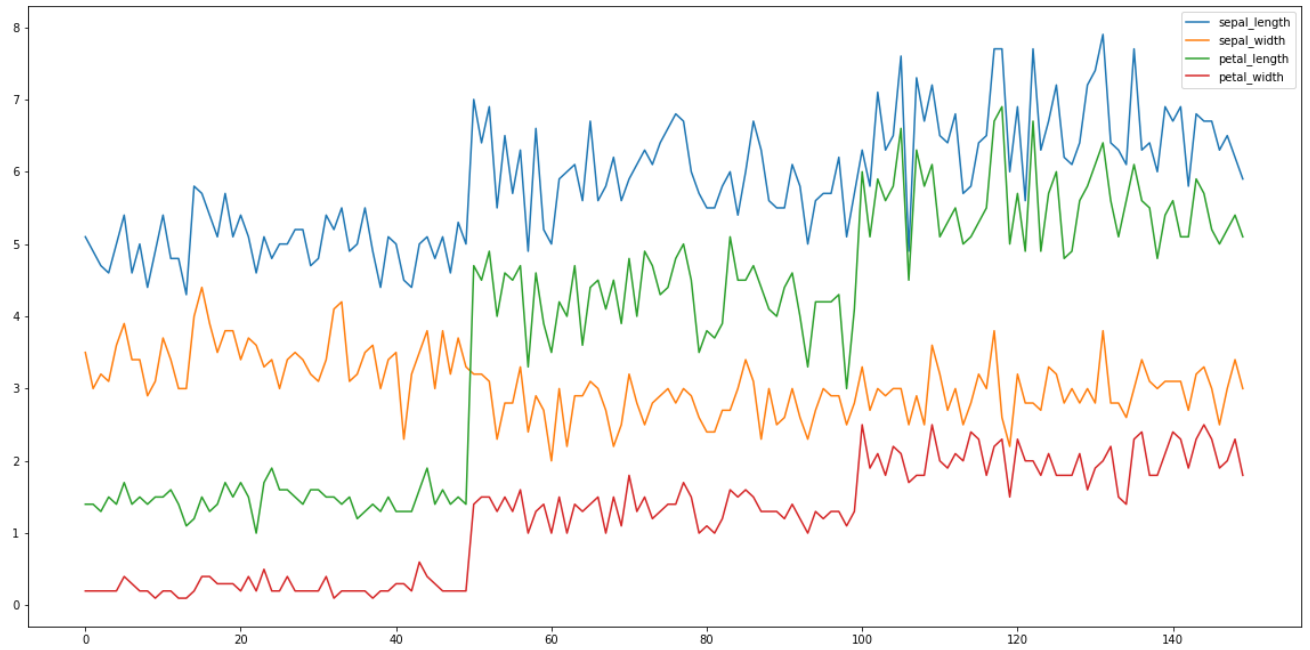
Out[37]:

	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

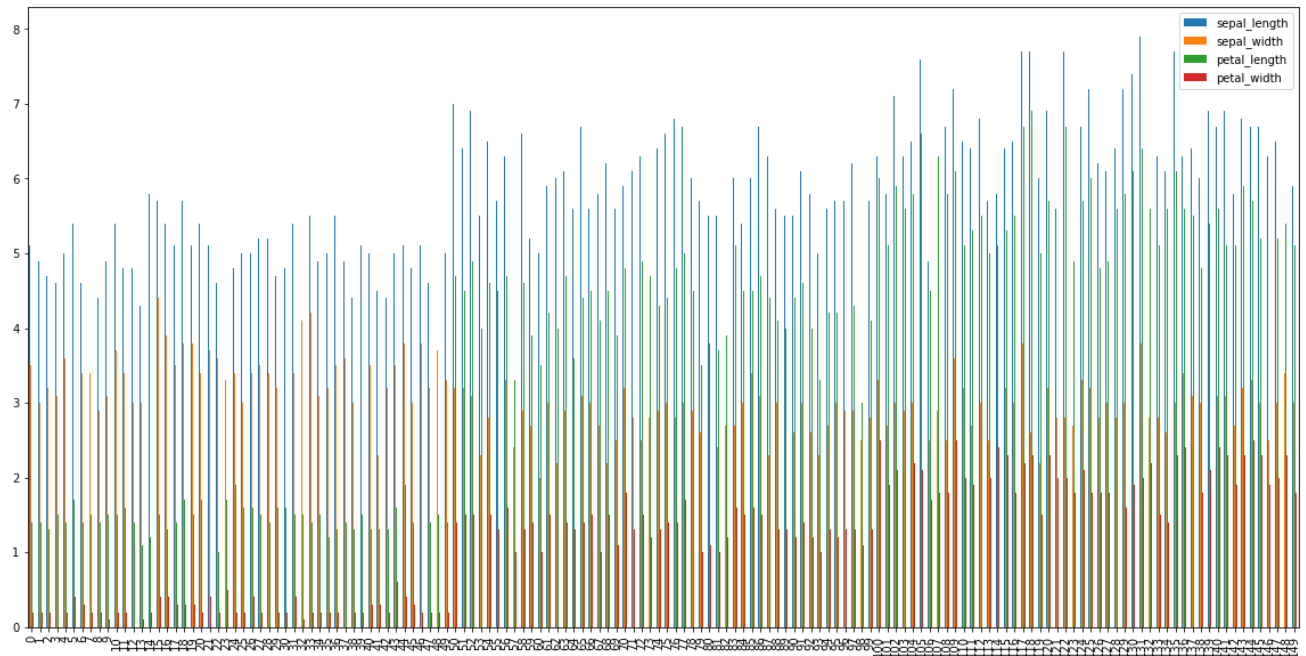
```
In [41]: # 'figsize' for size of the figure  
df.plot(figsize=(20,10))
```

Out[41]: <AxesSubplot:>



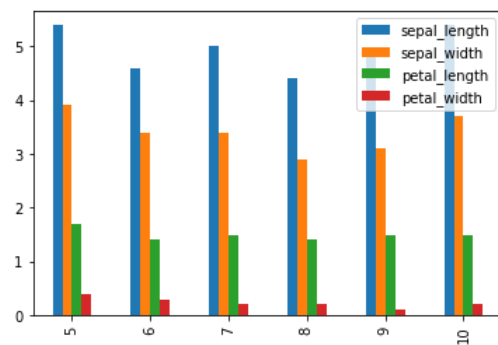
```
In [43]: df.plot(kind='bar',figsize=(20,10))
```

```
Out[43]: <AxesSubplot:>
```



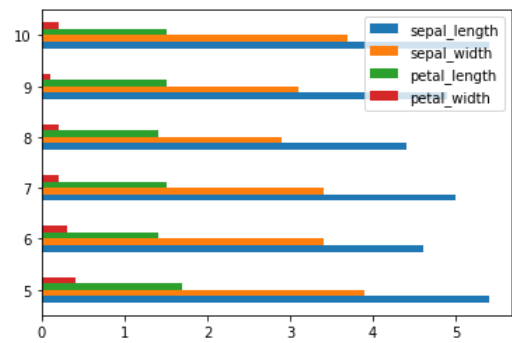
```
In [44]: df.iloc[5:11].plot(kind='bar')
```

```
Out[44]: <AxesSubplot:>
```



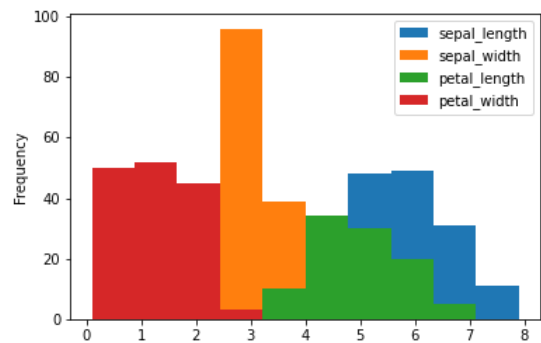
In [45]: `df.iloc[5:11].plot(kind='barh')`

Out[45]: `<AxesSubplot:>`



In [46]: `#'hist' histogr
x axis shows ranges
y axis shows frequency
df.plot(kind='hist')`

Out[46]: `<AxesSubplot:ylabel='Frequency'>`



In [47]: `df`

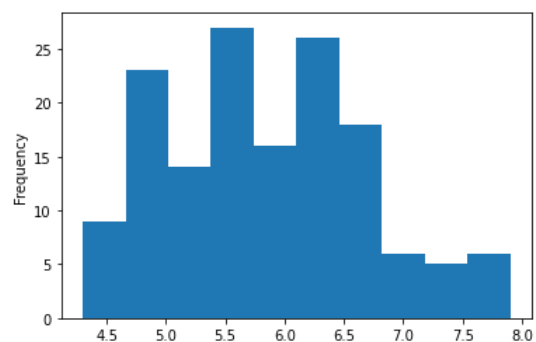
Out[47]:

	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

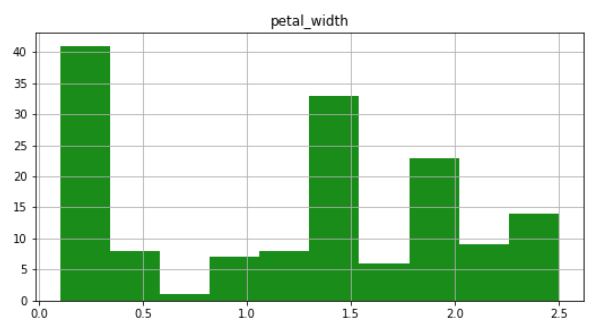
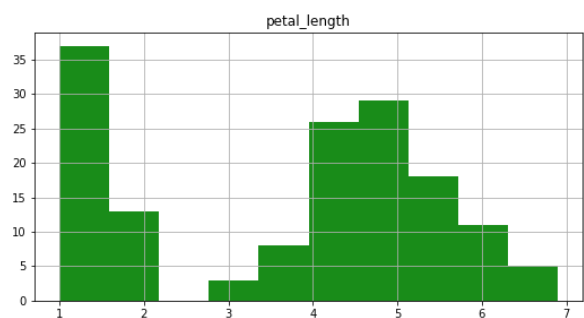
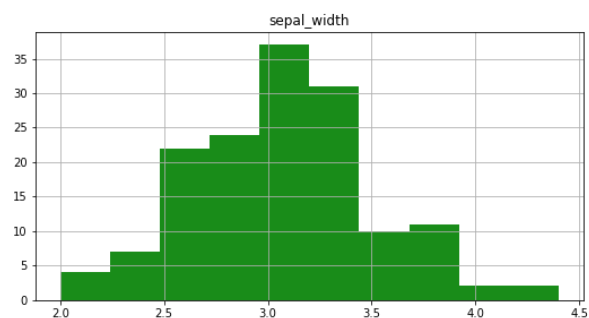
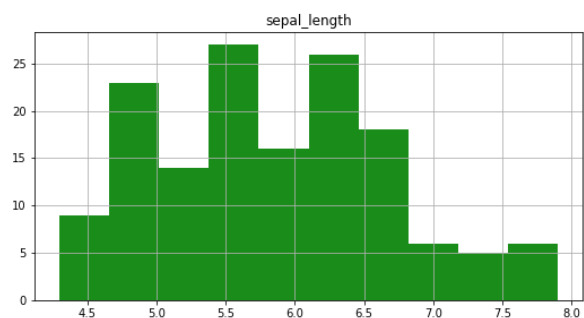

```
In [48]: df['sepal_length'].plot(kind='hist')
```

```
Out[48]: <AxesSubplot:ylabel='Frequency'>
```



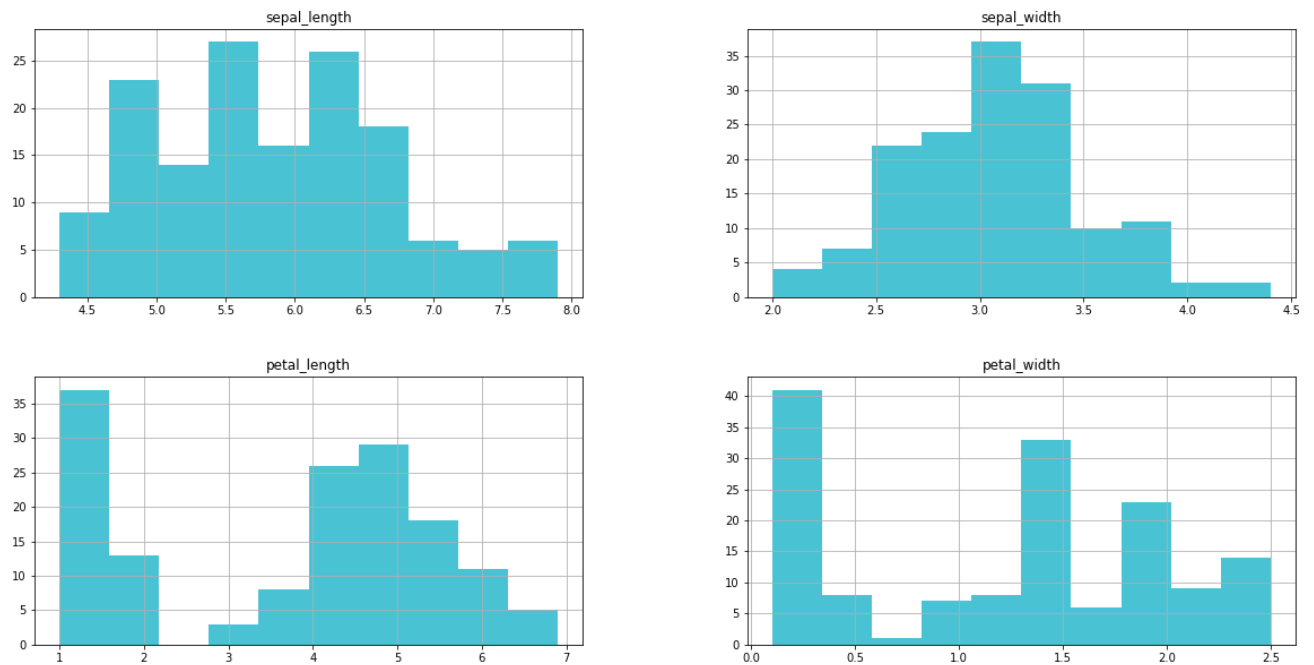
```
In [51]: df.hist(figsize=(20,10),color='g',alpha=.9)
```

```
Out[51]: array([[<AxesSubplot:title={'center':'sepal_length'}>,<AxesSubplot:title={'center':'sepal_width'}>],<AxesSubplot:title={'center':'petal_length'}>,<AxesSubplot:title={'center':'petal_width'}>]], dtype=object)
```



```
In [52]: # "https://uicolorpicker.com/" copy hexadecimal code for color u wanna choose
df.hist(figsize=(20,10),color='#35BDD0',alpha=.9)
```

```
Out[52]: array([[<AxesSubplot:title={'center':'sepal_length'}>,
  <AxesSubplot:title={'center':'sepal_width'}>],
  [<AxesSubplot:title={'center':'petal_length'}>,
  <AxesSubplot:title={'center':'petal_width'}>]], dtype=object)
```



```
In [53]: import cufflinks as cf
cf.go_offline()
```

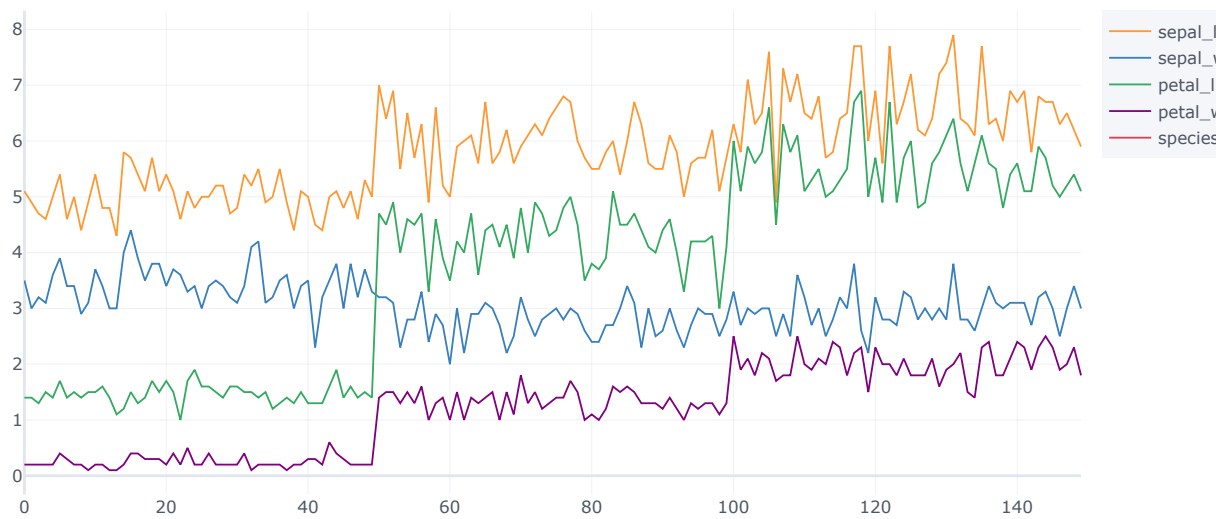
```
In [54]: df
```

Out[54]:

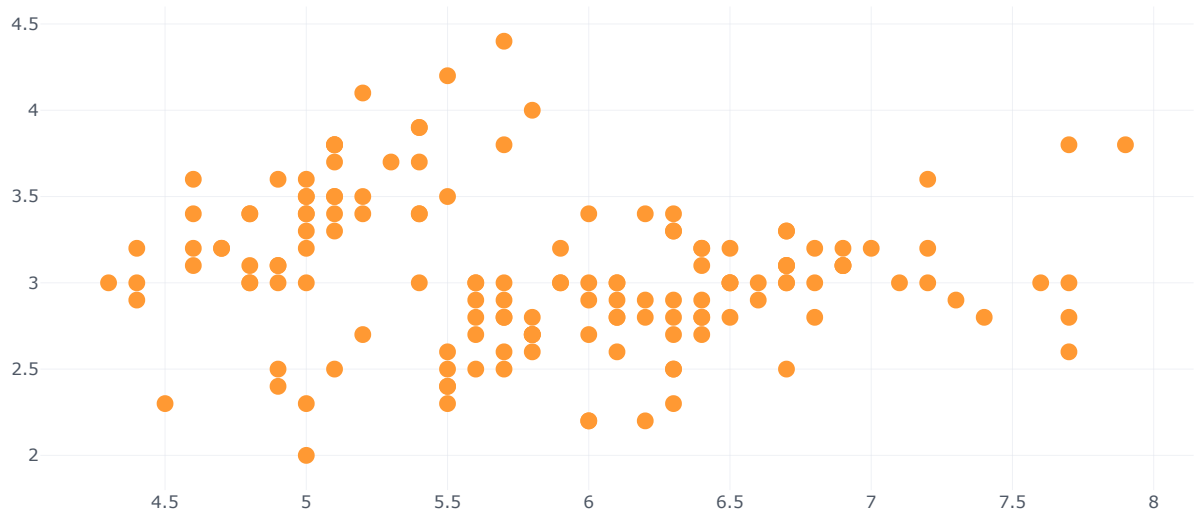
	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica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

150 rows × 5 columns

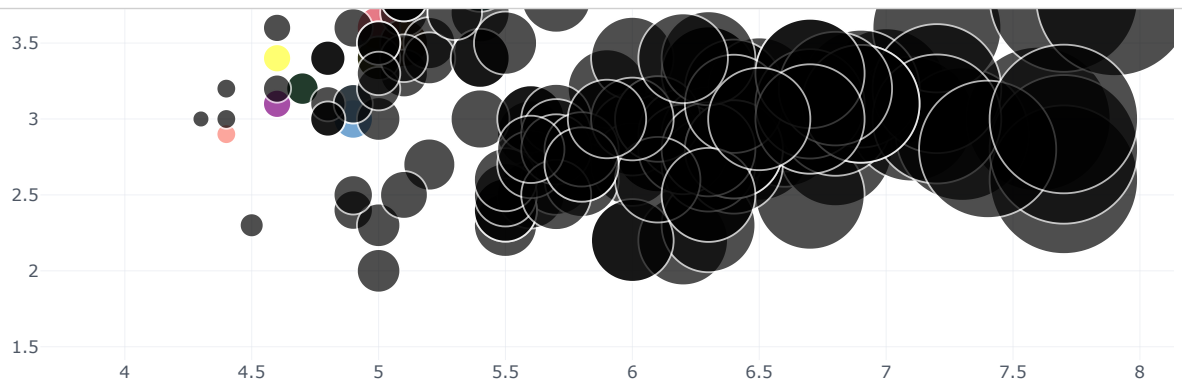
```
In [56]: df.iplot()
```



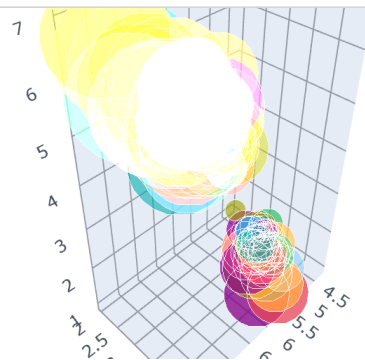
```
In [57]: df.iplot(x='sepal_length',y='sepal_width',mode='markers')
```



```
In [59]: df.iplot(x='sepal_length',y='sepal_width',size='sepal_length',kind='bubble')
```



```
In [61]: df.iplot(x='sepal_length',y='sepal_width',z='petal_length',size='sepal_length',kind='bubble3d')
```



```
In [62]: df1=sns.load_dataset('tips')
```

```
In [63]: df1
```

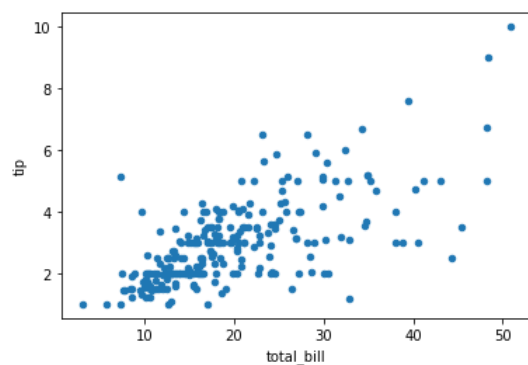
```
Out[63]:
```

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
...
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female	Yes	Sat	Dinner	2
241	22.67	2.00	Male	Yes	Sat	Dinner	2
242	17.82	1.75	Male	No	Sat	Dinner	2
243	18.78	3.00	Female	No	Thur	Dinner	2

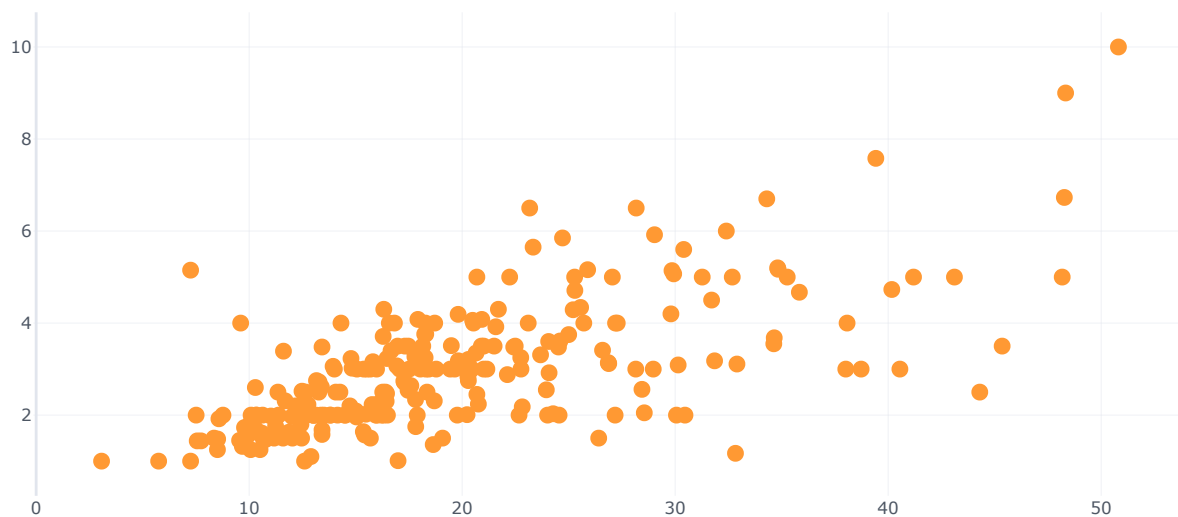
244 rows × 7 columns

```
In [64]: df1.plot(x='total_bill',y='tip',kind='scatter')
```

```
Out[64]: <AxesSubplot:xlabel='total_bill', ylabel='tip'>
```

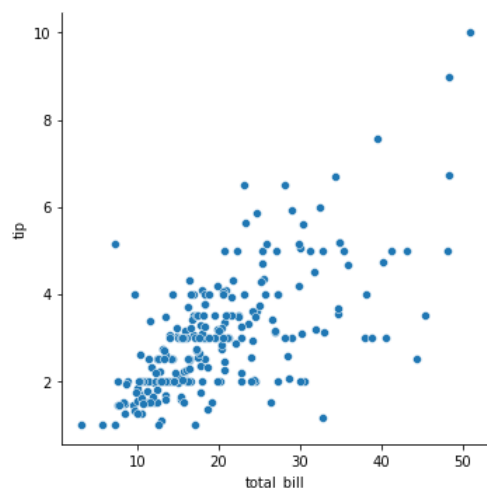


```
In [66]: df1.iplot(x='total_bill',y='tip',kind='scatter',mode='markers')
```



```
In [69]: sns.relplot(x='total_bill',y='tip',data=df1)
```

```
Out[69]: <seaborn.axisgrid.FacetGrid at 0x2b62624eeb0>
```



```
In [70]: df1
```

```
Out[70]:
```

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
...
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female	Yes	Sat	Dinner	2
241	22.67	2.00	Male	Yes	Sat	Dinner	2
242	17.82	1.75	Male	No	Sat	Dinner	2
243	18.78	3.00	Female	No	Thur	Dinner	2

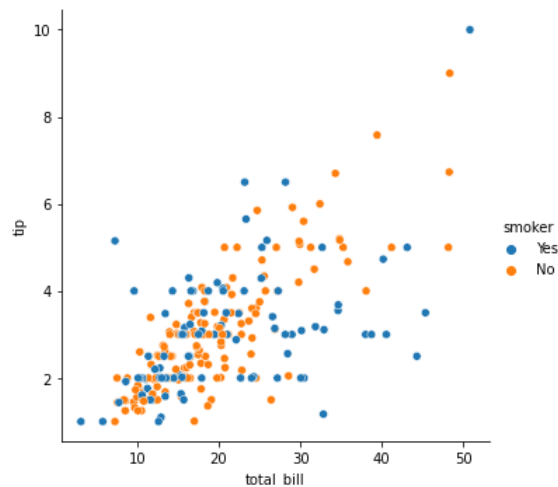
244 rows × 7 columns

```
In [78]: df1['smoker'].value_counts()
```

```
Out[78]: No      151
Yes       93
Name: smoker, dtype: int64
```

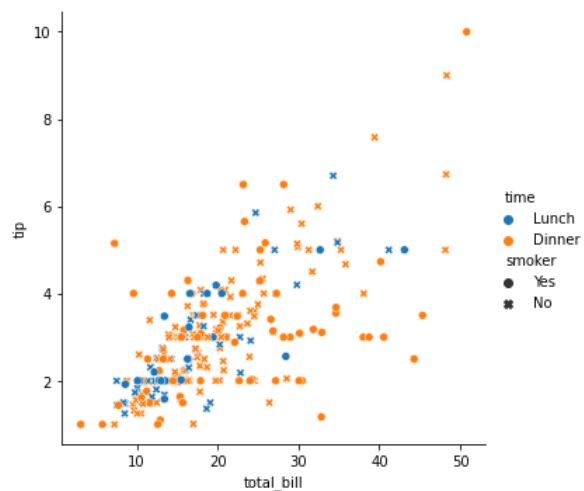
```
In [79]: sns.relplot(x='total_bill',y='tip',data=df1,hue='smoker')
```

```
Out[79]: <seaborn.axisgrid.FacetGrid at 0x2b6259fdc10>
```



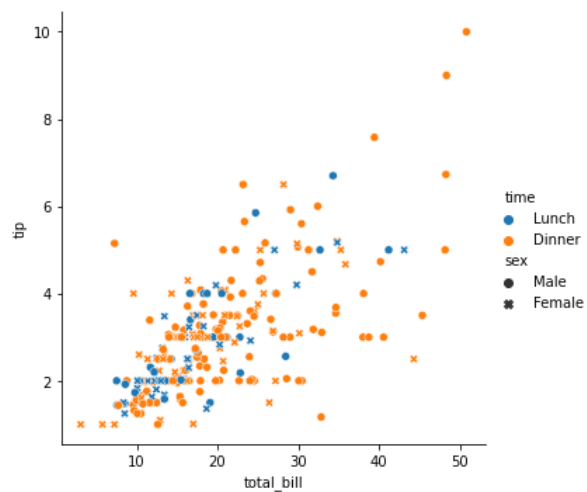
```
In [80]: sns.relplot(x='total_bill',y='tip',data=df1,hue='time',style='smoker')
```

```
Out[80]: <seaborn.axisgrid.FacetGrid at 0x2b6258f6040>
```



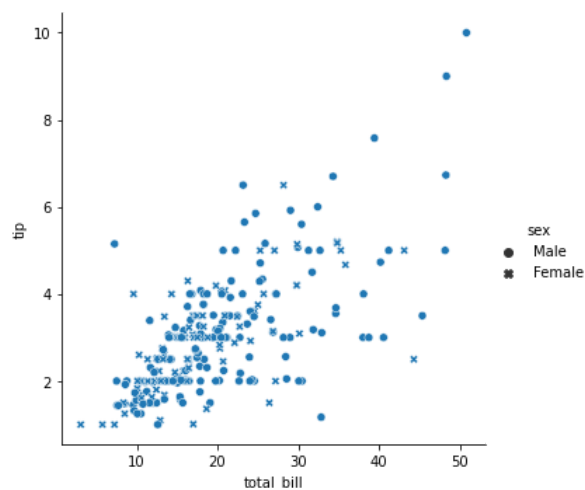
```
In [81]: sns.relplot(x='total_bill',y='tip',data=df1,hue='time',style='sex')
```

```
Out[81]: <seaborn.axisgrid.FacetGrid at 0x2b62646dac0>
```



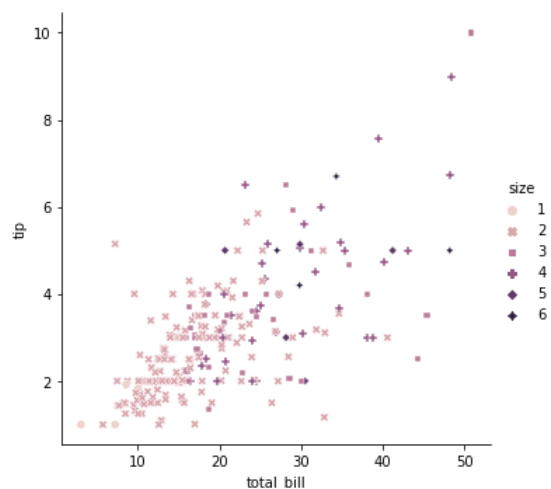
```
In [82]: sns.relplot(x='total_bill',y='tip',data=df1,style='sex')
```

```
Out[82]: <seaborn.axisgrid.FacetGrid at 0x2b62657a100>
```



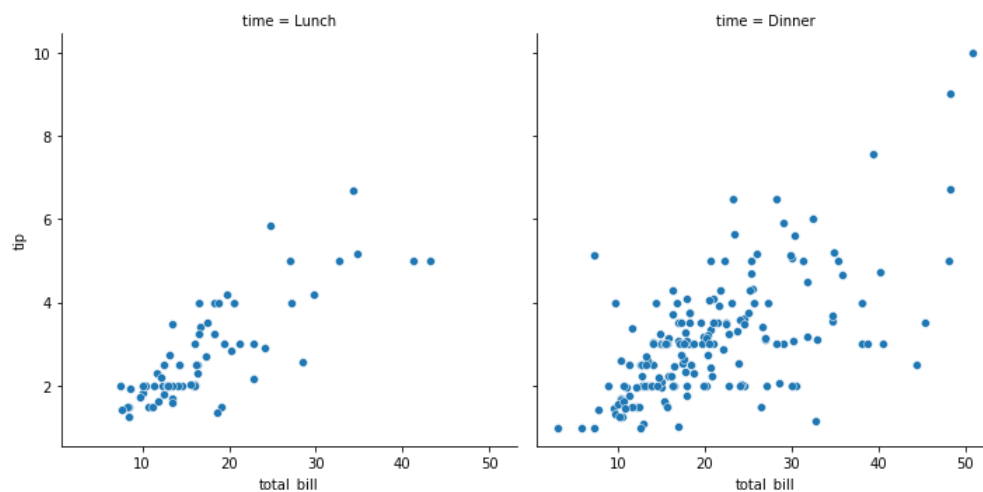
```
In [83]: sns.relplot(x='total_bill',y='tip',data=df1,hue='size',style='size')
```

```
Out[83]: <seaborn.axisgrid.FacetGrid at 0x2b6275b1940>
```



```
In [84]: sns.relplot(x='total_bill',y='tip',data=df1,col='time')
```

```
Out[84]: <seaborn.axisgrid.FacetGrid at 0x2b626503a00>
```




```
In [85]: df
```

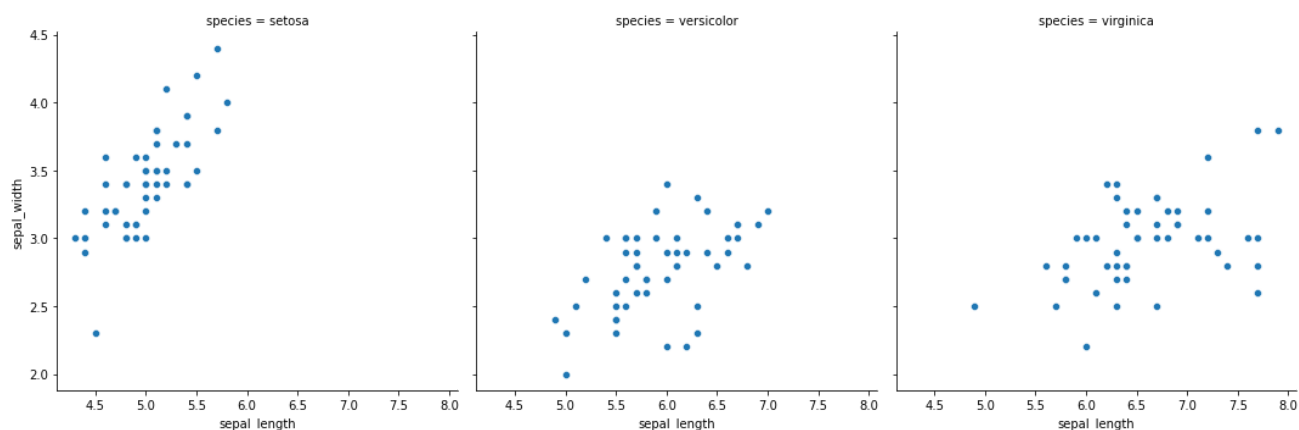
```
Out[85]:
```

	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

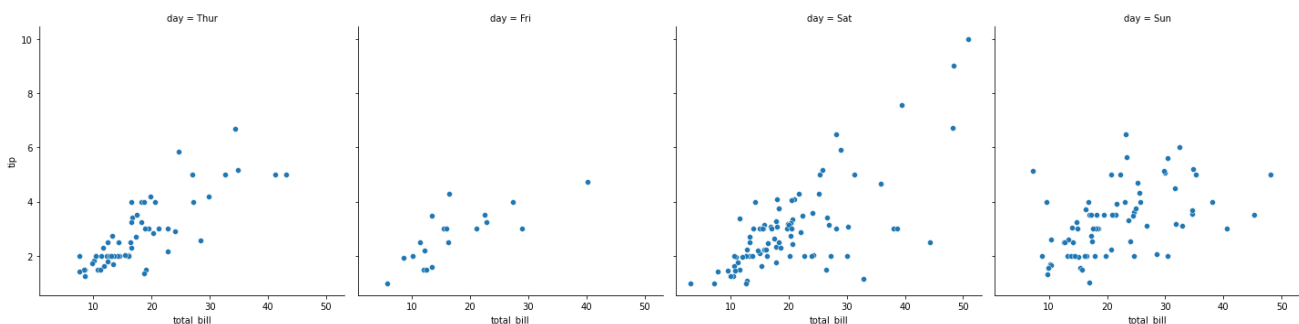
```
In [86]: sns.relplot(x='sepal_length',y='sepal_width',data=df,col='species')
```

```
Out[86]: <seaborn.axisgrid.FacetGrid at 0x2b62779f040>
```



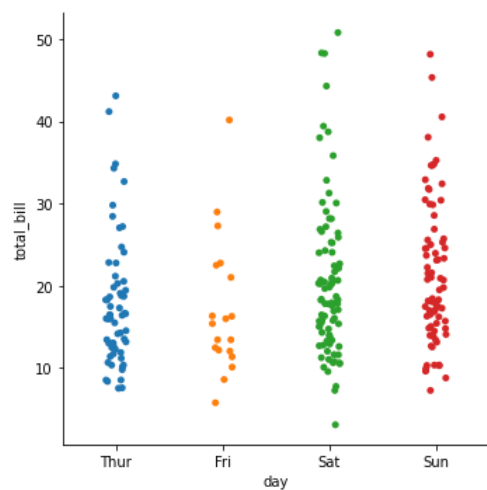
```
In [88]: sns.relplot(x='total_bill',y='tip',data=df1,col='day')
```

```
Out[88]: <seaborn.axisgrid.FacetGrid at 0x2b62629c220>
```



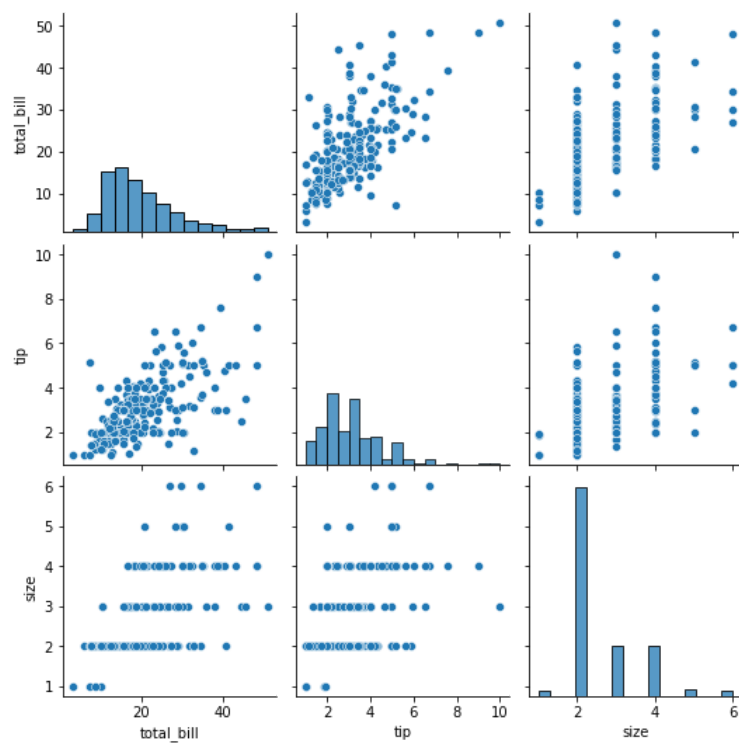
```
In [90]: sns.catplot(x='day',y='total_bill',data=df1)
```

```
Out[90]: <seaborn.axisgrid.FacetGrid at 0x2b627648220>
```



```
In [91]: #only numerical data
sns.pairplot(df1)
```

```
Out[91]: <seaborn.axisgrid.PairGrid at 0x2b627fa63d0>
```



In [92]: df1

Out[92]:

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
...
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female	Yes	Sat	Dinner	2
241	22.67	2.00	Male	Yes	Sat	Dinner	2
242	17.82	1.75	Male	No	Sat	Dinner	2
243	18.78	3.00	Female	No	Thur	Dinner	2

244 rows × 7 columns

In [93]: df

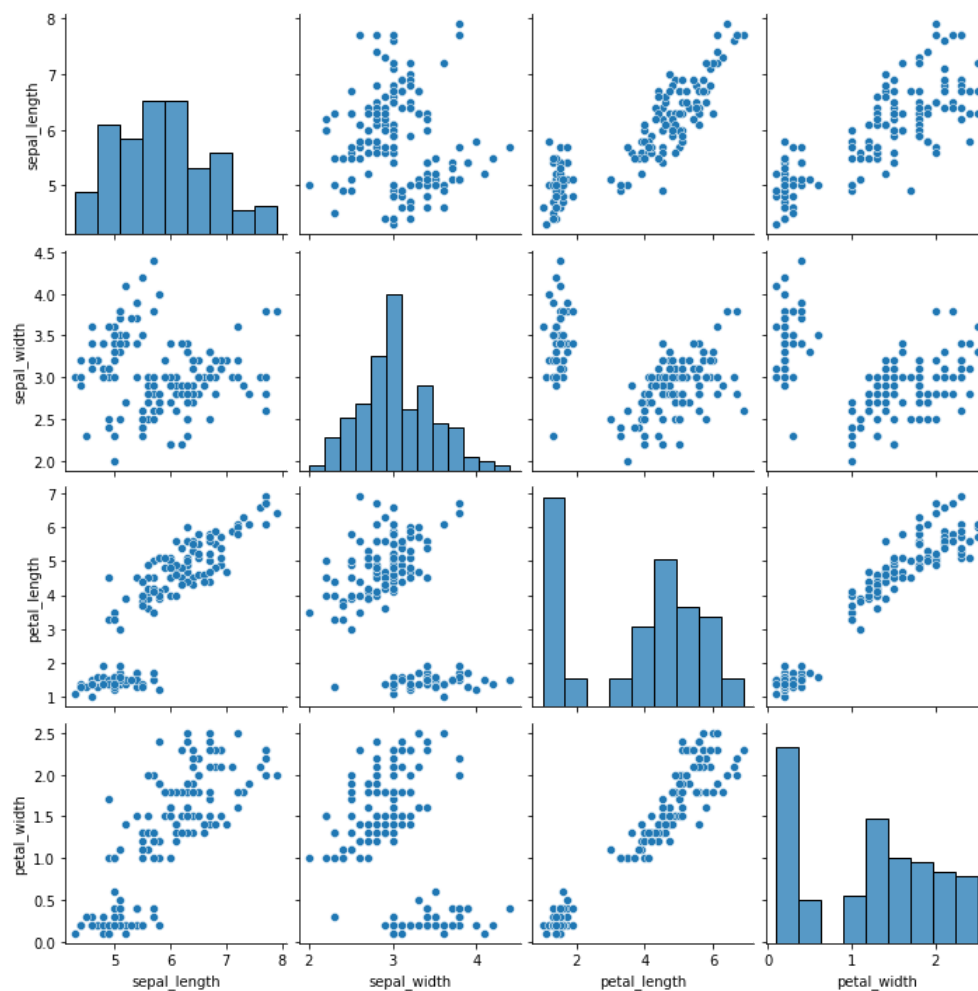
Out[93]:

	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

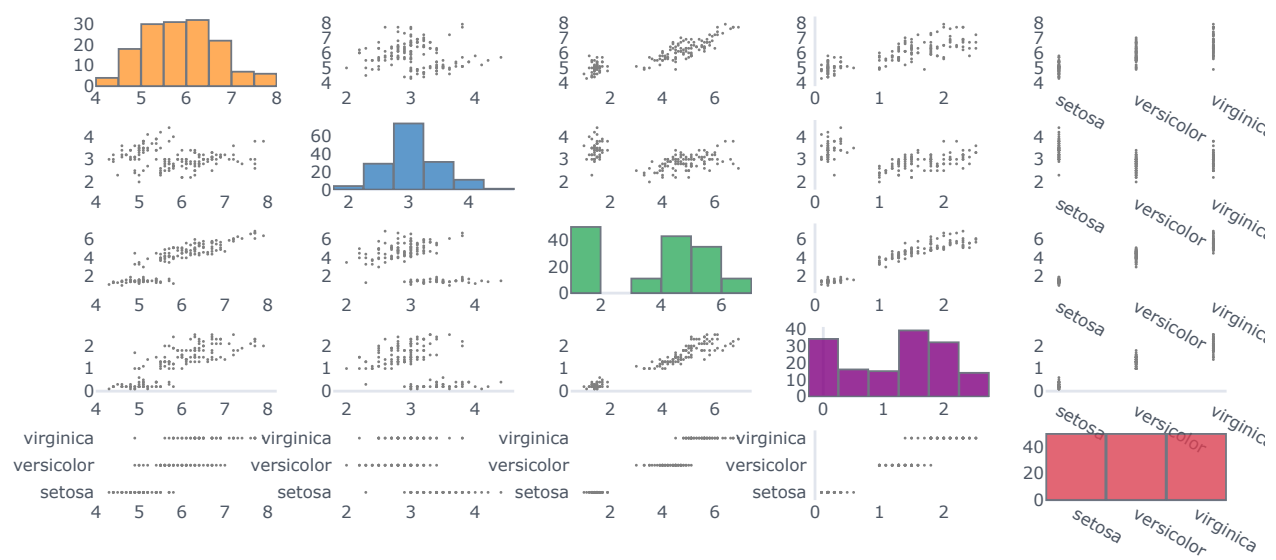
150 rows × 5 columns

```
In [94]: sns.pairplot(df)
```

```
Out[94]: <seaborn.axisgrid.PairGrid at 0x2b629cf7970>
```



In [95]: df.scatter_matrix()



In [96]: df1

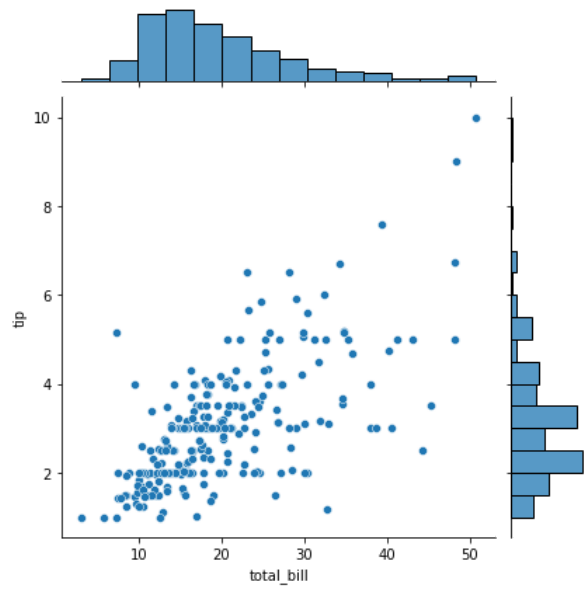
Out[96]:

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
...
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female	Yes	Sat	Dinner	2
241	22.67	2.00	Male	Yes	Sat	Dinner	2
242	17.82	1.75	Male	No	Sat	Dinner	2
243	18.78	3.00	Female	No	Thur	Dinner	2

244 rows × 7 columns

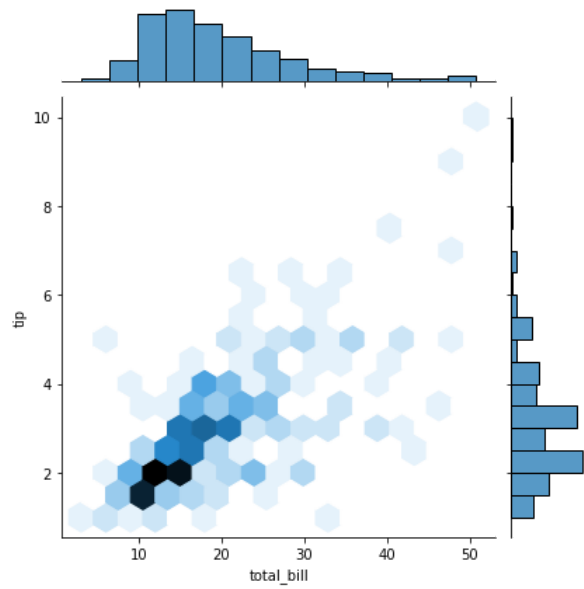
```
In [97]: sns.jointplot(x=df1.total_bill, y=df1.tip)
```

```
Out[97]: <seaborn.axisgrid.JointGrid at 0x2b628260670>
```



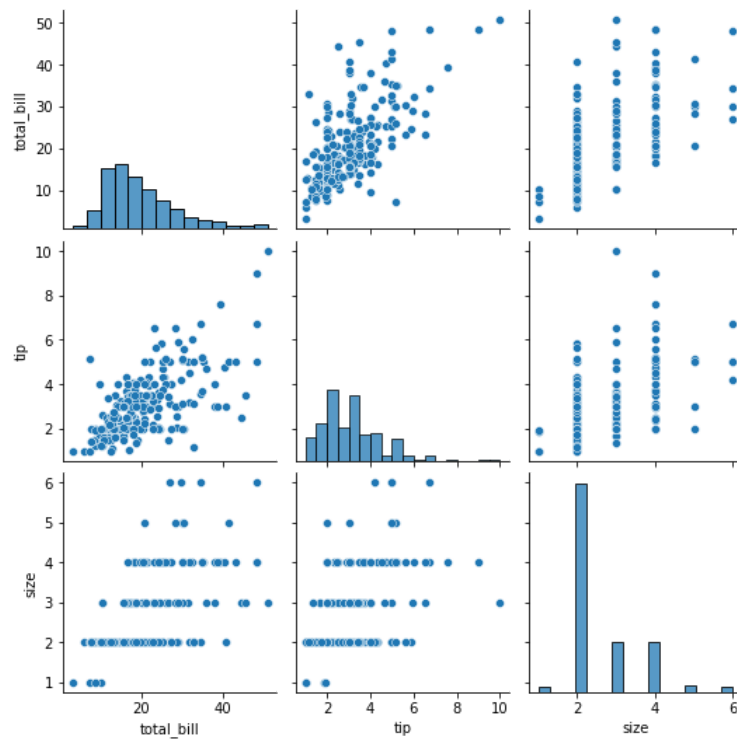
```
In [98]: sns.jointplot(x=df1.total_bill, y=df1.tip, kind='hex')
```

```
Out[98]: <seaborn.axisgrid.JointGrid at 0x2b628264d90>
```

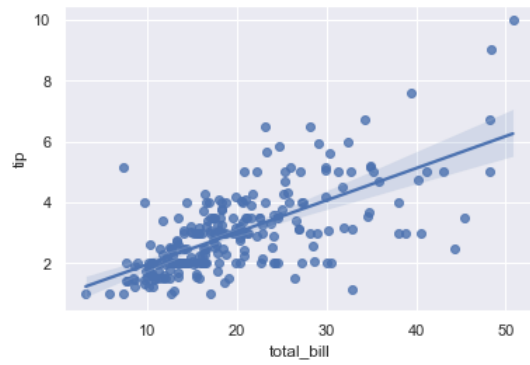


```
In [99]: sns.pairplot(df1)
```

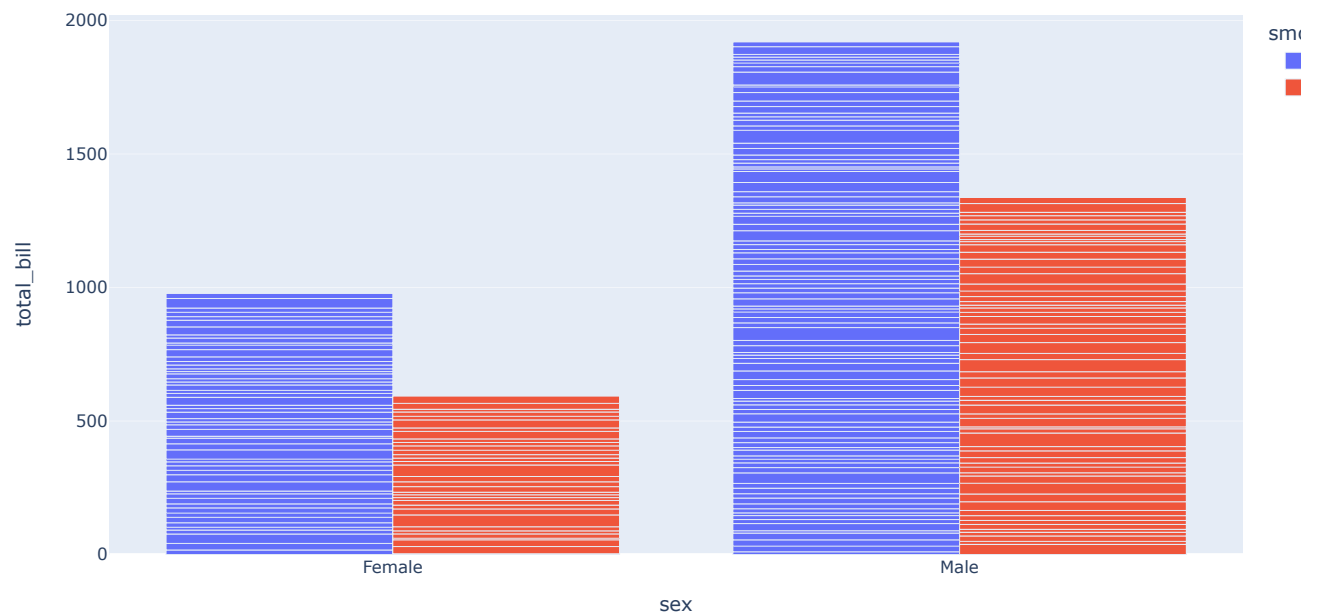
```
Out[99]: <seaborn.axisgrid.PairGrid at 0x2b62a69cac0>
```



```
In [102]: sns.regplot(x=df1.total_bill,y=df1.tip)
sns.set(rc={'figure.figsize':(20,10)})
```



```
In [104]: import plotly.express as px
fig=px.bar(df1,x="sex",y="total_bill",color="smoker",barmode="group")
fig.show()
```



```
In [ ]:
```