NAME:PRIYANSHU MANOHAR PATIL ,DIV:A,BRANCH:EXTC,ROLLNO.:55

```
import numpy as np
a = np.array([2,3,4,5])
```

```
type(a)
```

```
numpy.ndarray
```

```
np.array([[1,2,3],[3,4,5],[3,6,7]])
```

```
array([[1, 2, 3],
       [3, 4, 5],
       [3, 6, 7]])
```

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

```
df = sns.load_dataset('iris')
```

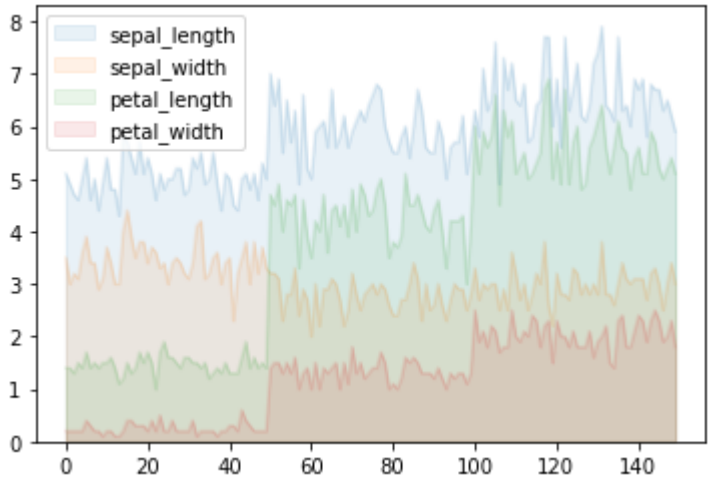
```
df
```

	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

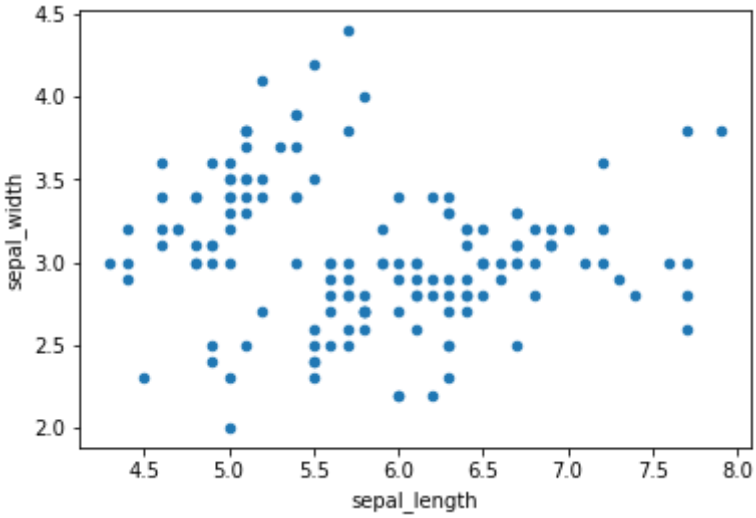
```
df.plot(kind = 'area',alpha =0.1,stacked = False)
```

```
<AxesSubplot:>
```



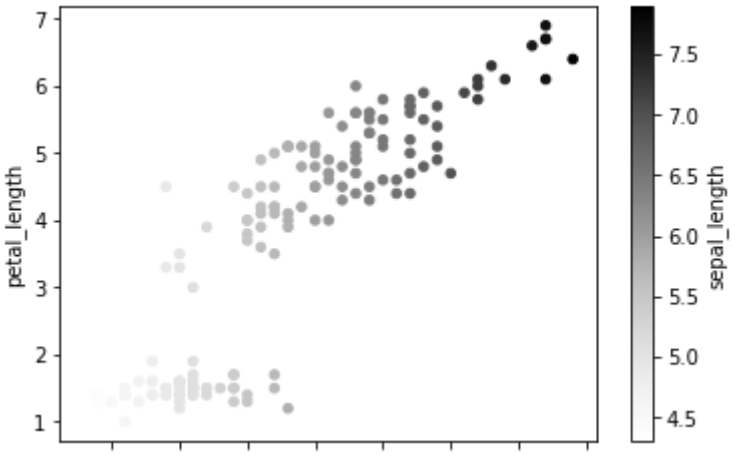

```
df.plot.scatter(x='sepal_length',y = 'sepal_width')
```

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



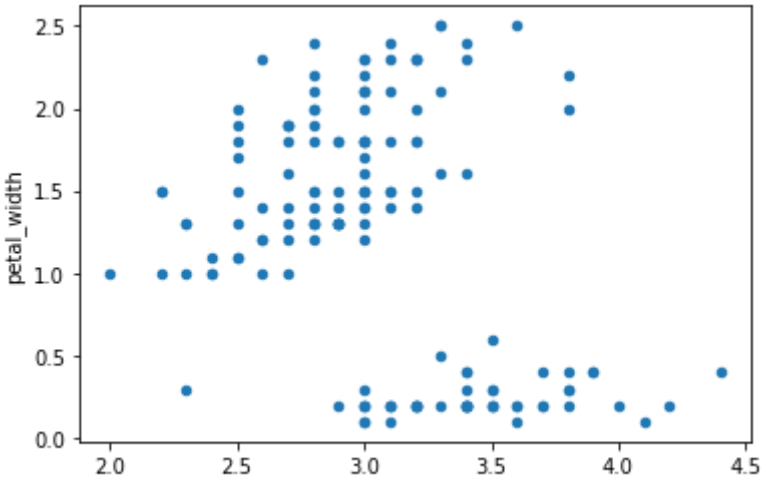

```
df.plot.scatter(x='sepal_length',y = 'petal_length', c='sepal_length')
```

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



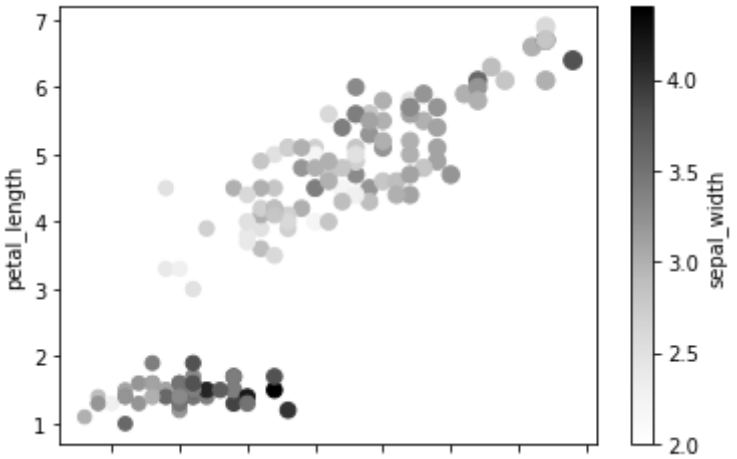

```
df.plot.scatter(x='sepal_width',y = 'petal_width')
```

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




```
df.plot.scatter(x='sepal_length',y='petal_length', c='sepal_width',s=df['sepal_length']*10
```

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




```
df.plot.hexbin(x='sepal_length',y='petal_length', gridsize=10,cmap="viridis")
```

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


```
from mpl_toolkits import mplot3d
```

```
x = np.linspace(-1,6,30)
```

```
y=np.linspace(-1,6,30)

y
```

```
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.        ])
```

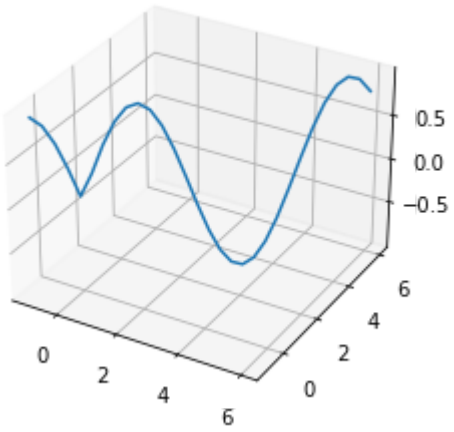
```
z = x+y


def sin_fun(x,y):
    return np.sin(np.sqrt(x**2+y**2))


z = sin_fun(x,y)


ax = plt.axes(projection = '3d')
ax.plot3D(x,y,z)
```

```
[<mpl_toolkits.mplot3d.art3d.Line3D at 0x294b15e34f0>]
```

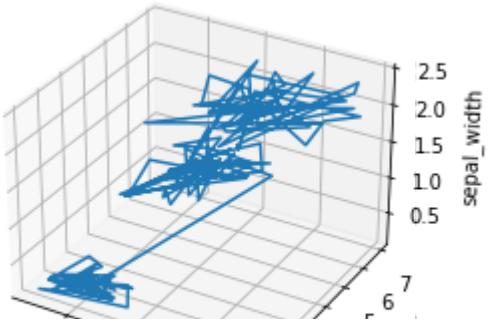



```
ax.set_xlabel('x')
ax.set_ylabel('y')
ax.set_zlabel("z")
```

```
Text(0.11410640661270852, 0.015287359751546225, 'z')
```

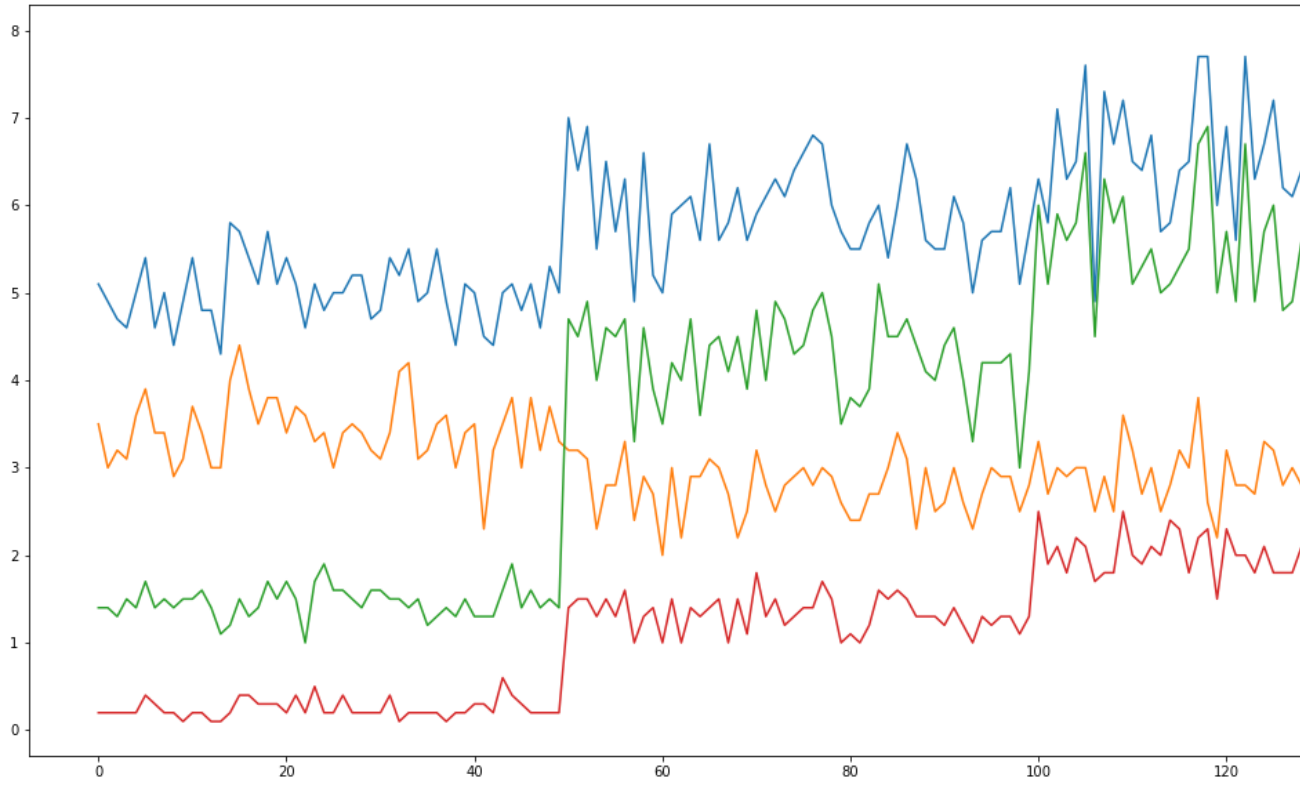
```
ax = plt.axes(projection = '3d')
ax.plot3D(df['sepal_length'],df['petal_length'],df['petal_width'])
ax.set_xlabel('sepal_length')
ax.set_ylabel('petal_length')
ax.set_zlabel("sepal_width")
```

```
Text(0.5, 0, 'sepal_width')
```



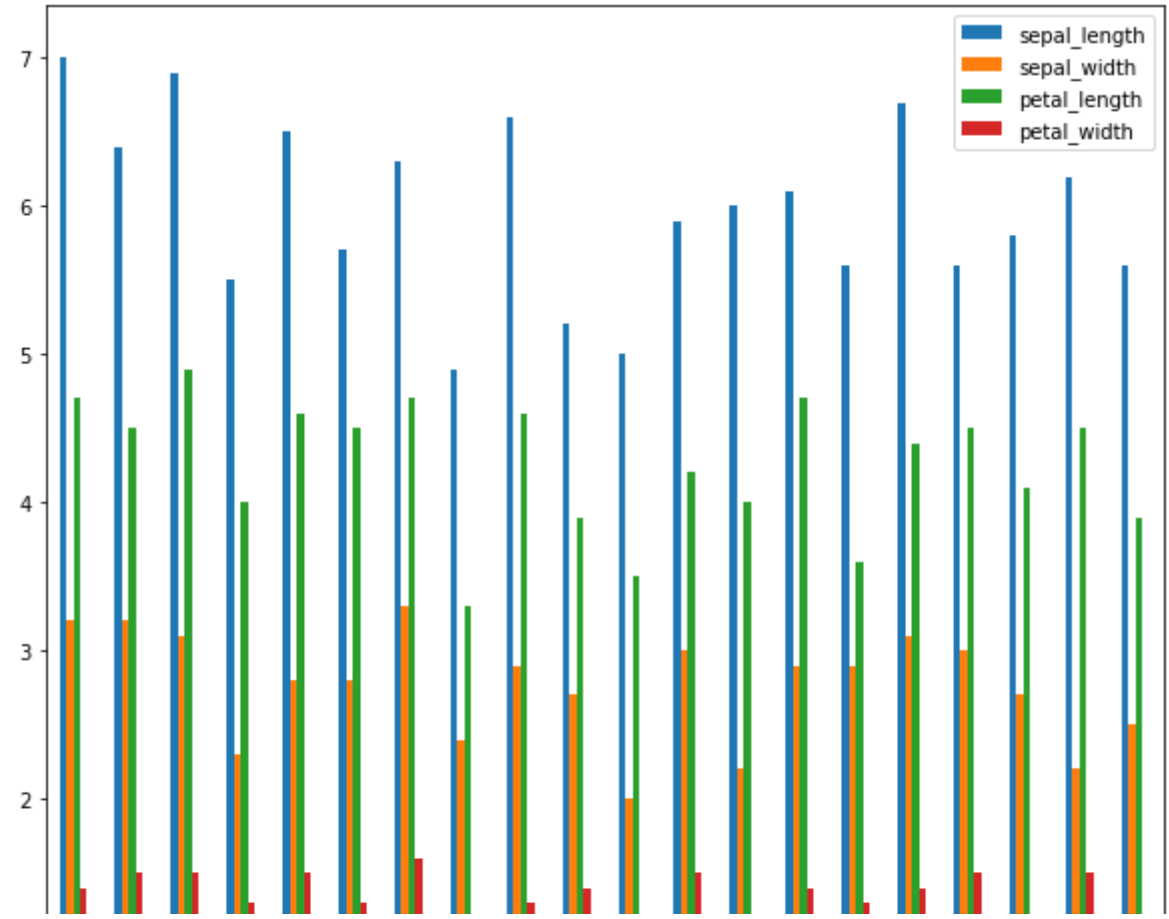

```
df.plot(figsize=(20,10))
```

```
<AxesSubplot:>
```




```
df.iloc[50:70].plot(kind = 'bar',figsize=(10,10))
```

```
<AxesSubplot:>
```

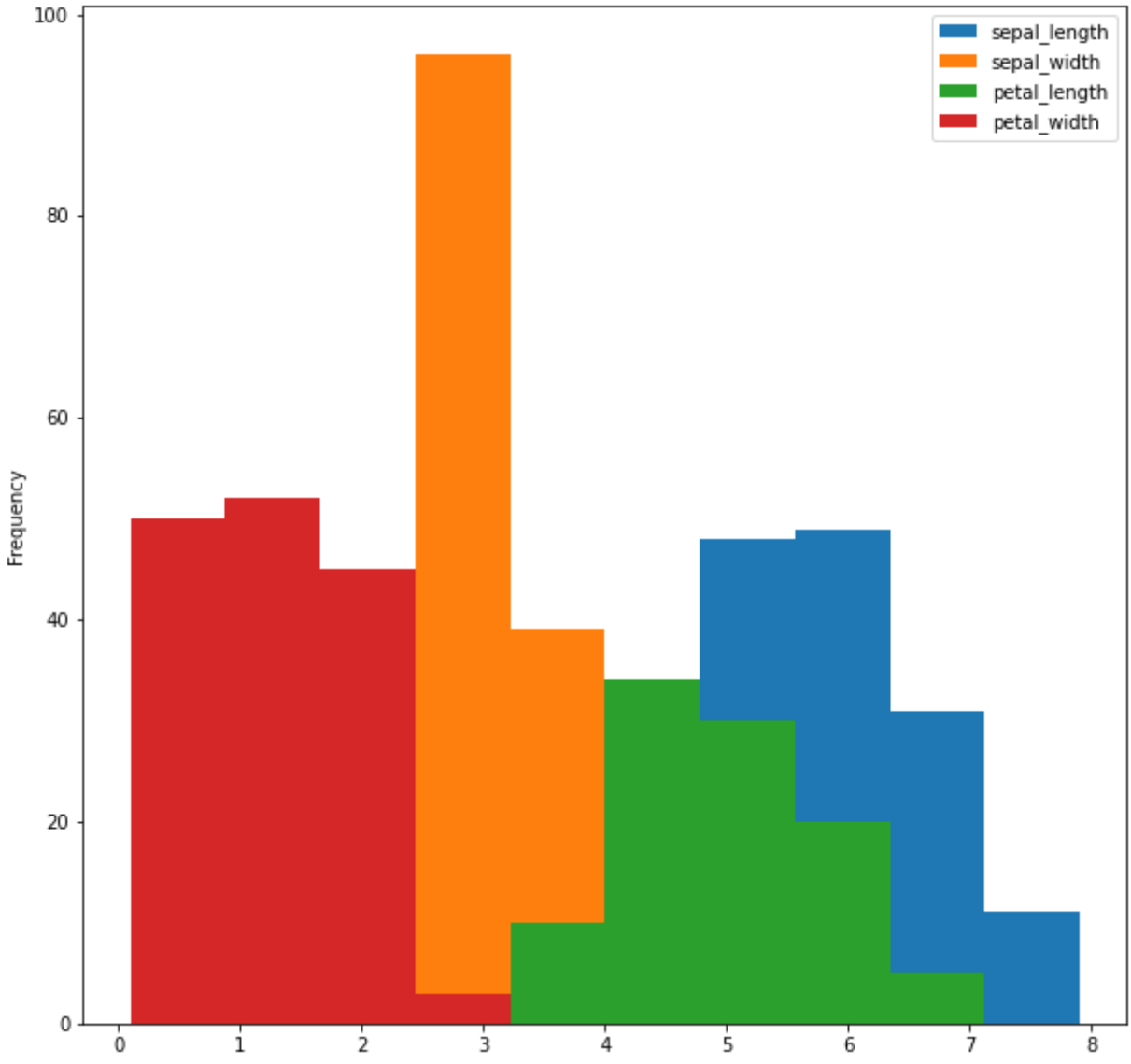



```
df.iloc[50:70].plot(kind = 'barh',figsize=(10,10))
```

```
<AxesSubplot:>
```


```
df.plot(kind='hist', figsize=(10,10))
```

```
<AxesSubplot:ylabel='Frequency'>
```

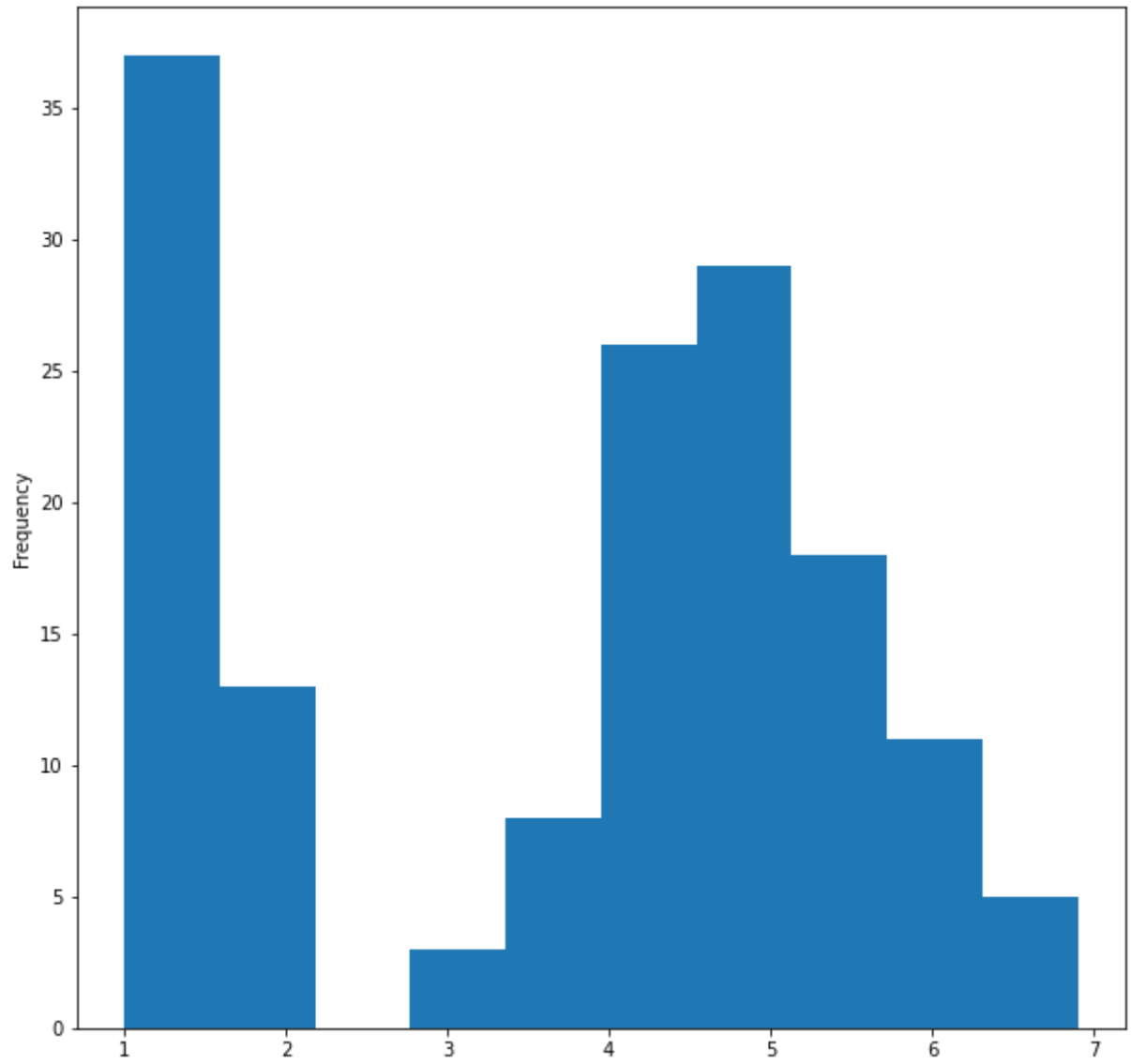



```
df
```

	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

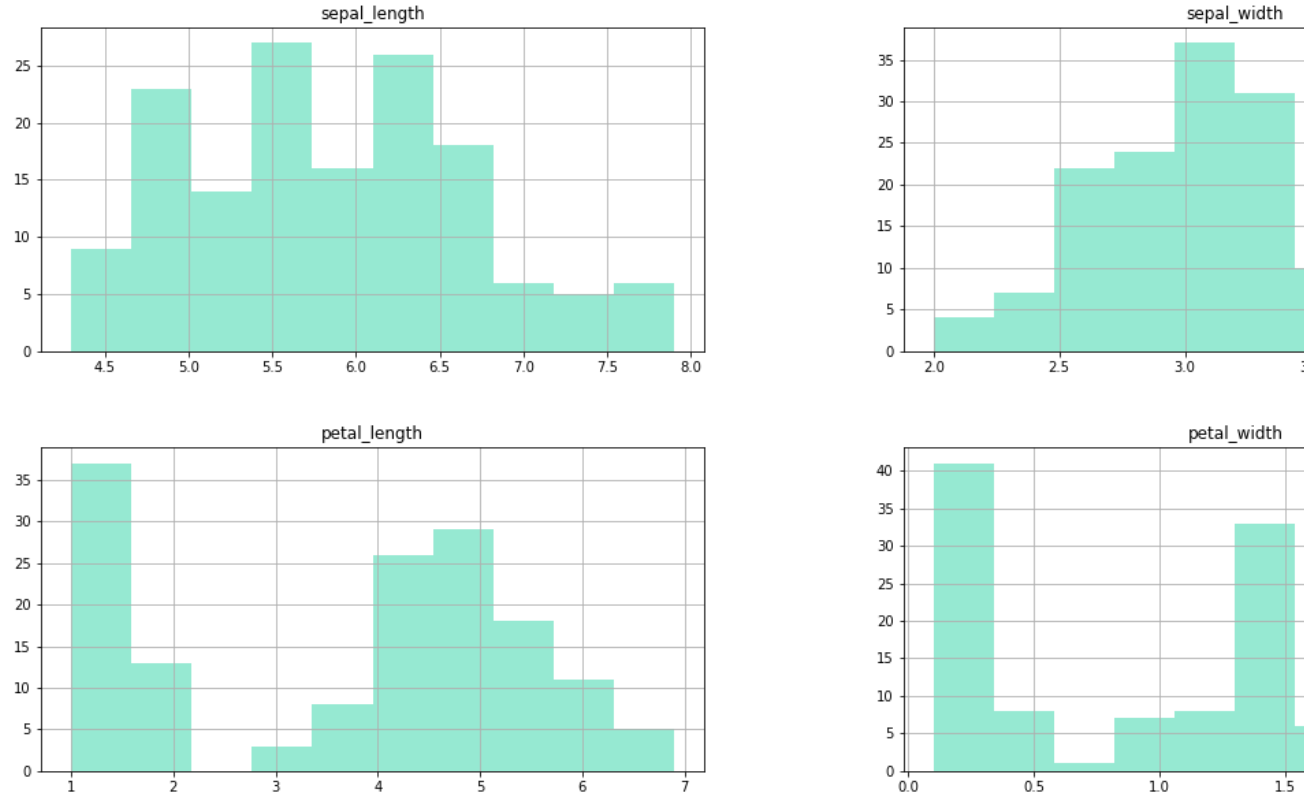
```
df['petal_length'].plot(kind='hist',figsize=(10,10))
```

```
<AxesSubplot:ylabel='Frequency'>
```




```
df.hist(figsize=(20,10), color='#50DBB4', alpha=0.6)
```

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




```
import cufflinks as cf
cf.go_offline()
```

```
df
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa

```
df.iplot()
```

```
df.iplot(x='sepal_length', y='sepal_width', kind='scatter', mode = 'markers')
```

```
df.iplot(x='sepal_length', y='sepal_width', size = 'sepal_length',kind='bubble')
```

```
df.iplot(x='sepal_length', y='sepal_width', z = 'petal_length',size = 'sepal_length',kind=
```

```
df1 = sns.load_dataset('tips')
```

```
df1
```

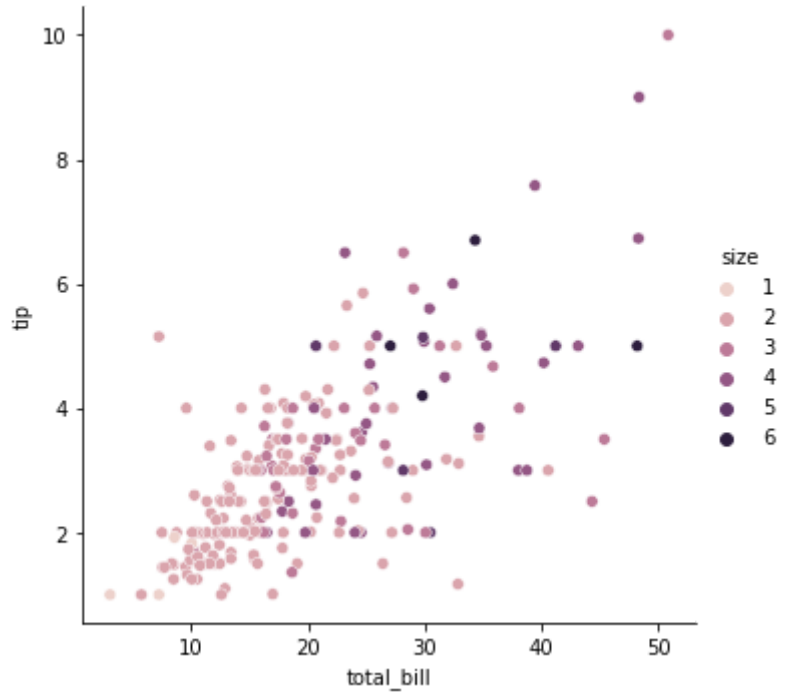
	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
...	...	...	...	...	...	...	...
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female	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

```
df1.iplot(x='total_bill',y='tip', kind = 'scatter', mode ='markers')
```

```
sns.relplot(x='total_bill', y='tip', data = df1, hue = 'size')
```

```
<seaborn.axisgrid.FacetGrid at 0x294b41dd730>
```




```
df1
```

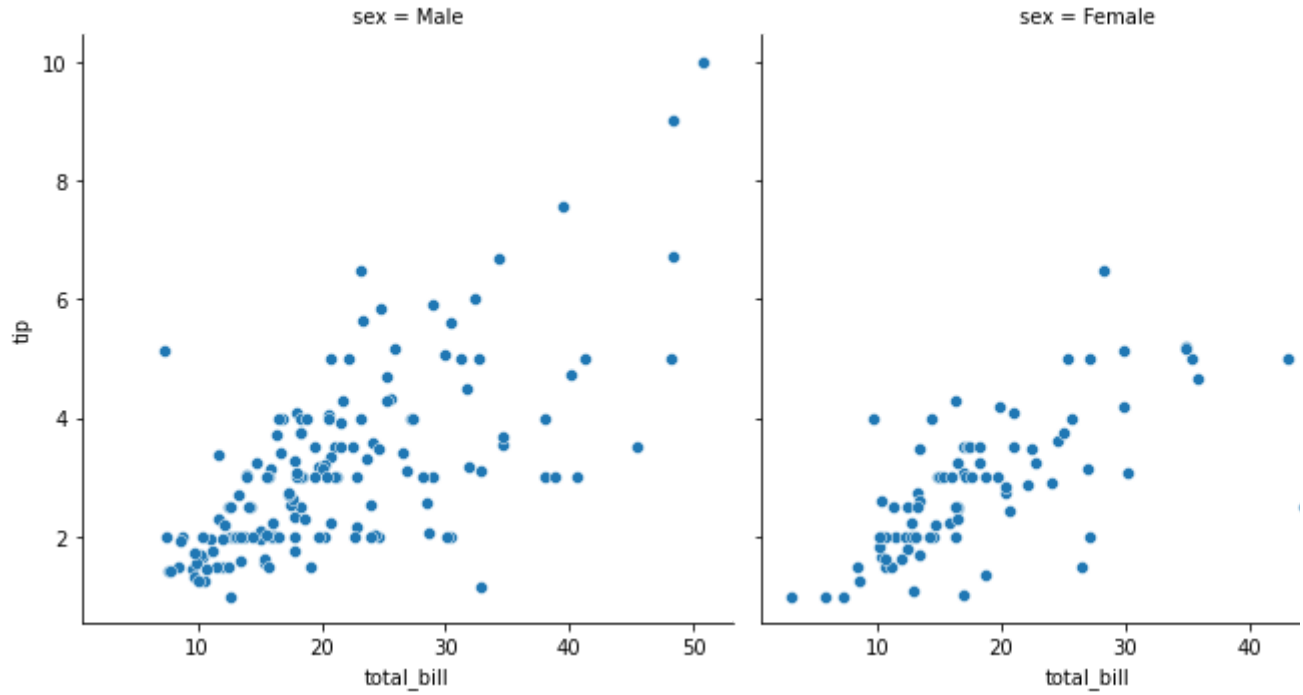
	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
...	...	...	...	...	...	...	...
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female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

```
df1['smoker'].value_counts()
```

```
No     151
Yes     93
Name: smoker, dtype: int64
```

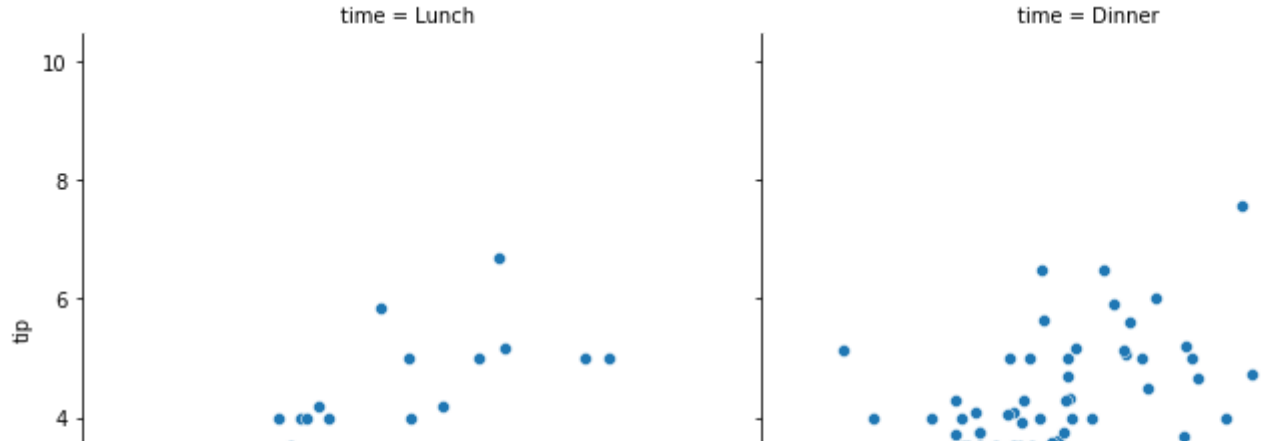
```
sns.relplot(x='total_bill', y='tip', data = df1, col = 'sex')
```

```
<seaborn.axisgrid.FacetGrid at 0x294b20d3730>
```



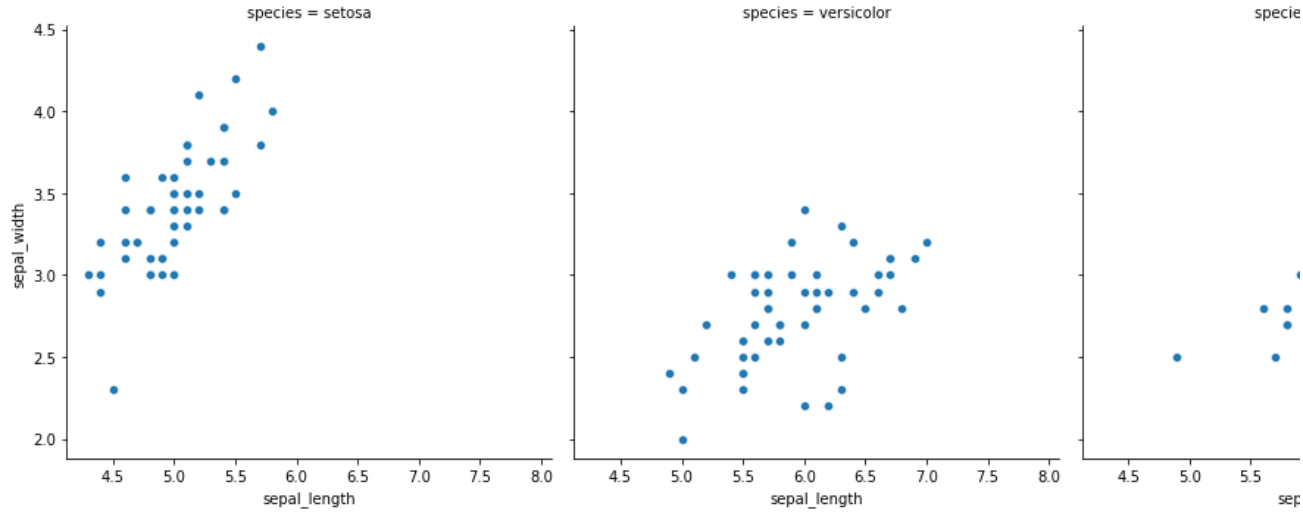

```
sns.relplot(x='total_bill', y='tip', data = df1, col = 'time')
```

```
<seaborn.axisgrid.FacetGrid at 0x294b1a33370>
```




```
sns.relplot(x='sepal_length', y='sepal_width', data = df, col = 'species')
```

```
<seaborn.axisgrid.FacetGrid at 0x294a9958400>
```

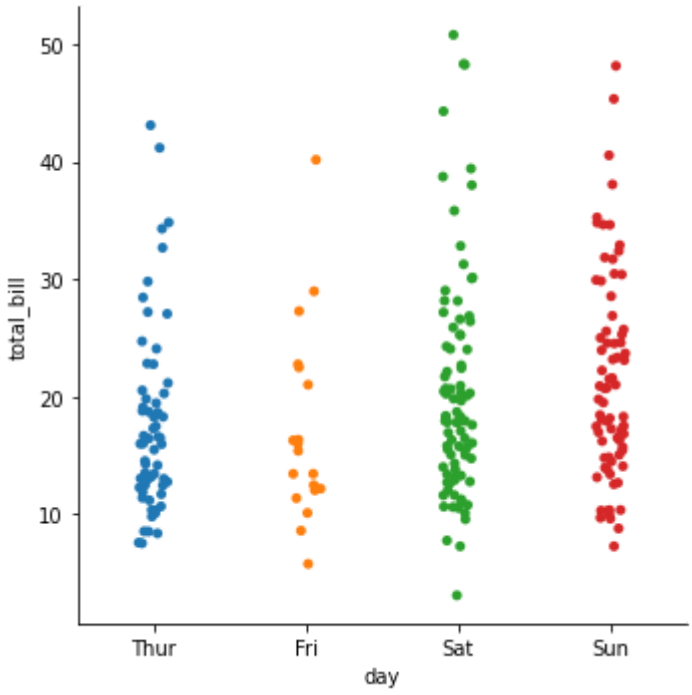



```
sns.relplot(x='total_bill', y='tip', data=df1, col='day')
```

```
<seaborn.axisgrid.FacetGrid at 0x294b4692520>
```


```
sns.catplot(x='day', y='total_bill', data=df1)
```

```
<seaborn.axisgrid.FacetGrid at 0x294b4b96160>
```




```
sns.pairplot(df1)
```

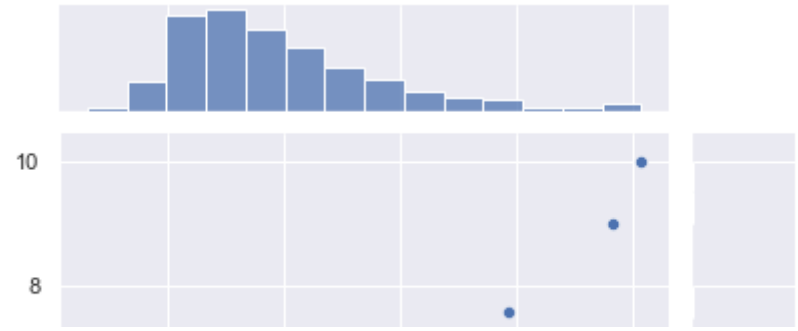
```
<seaborn.axisgrid.PairGrid at 0x294b4ded460>
```


```
df.scatter_matrix()
```

```
df1 = sns.load_dataset('tips')
```

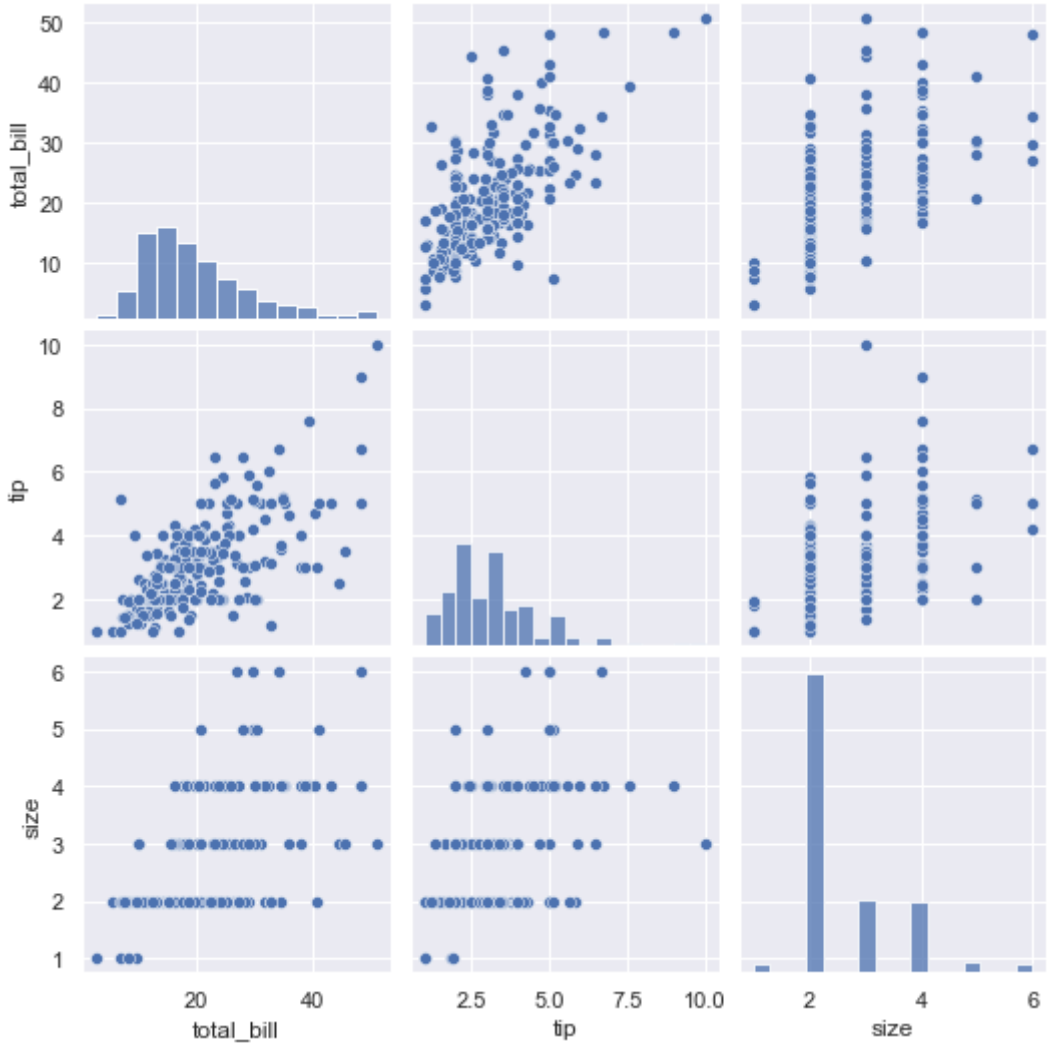
```
sns.jointplot(x=df1.total_bill, y=df1.tip)
```

```
<seaborn.axisgrid.JointGrid at 0x294b6cd3ee0>
```

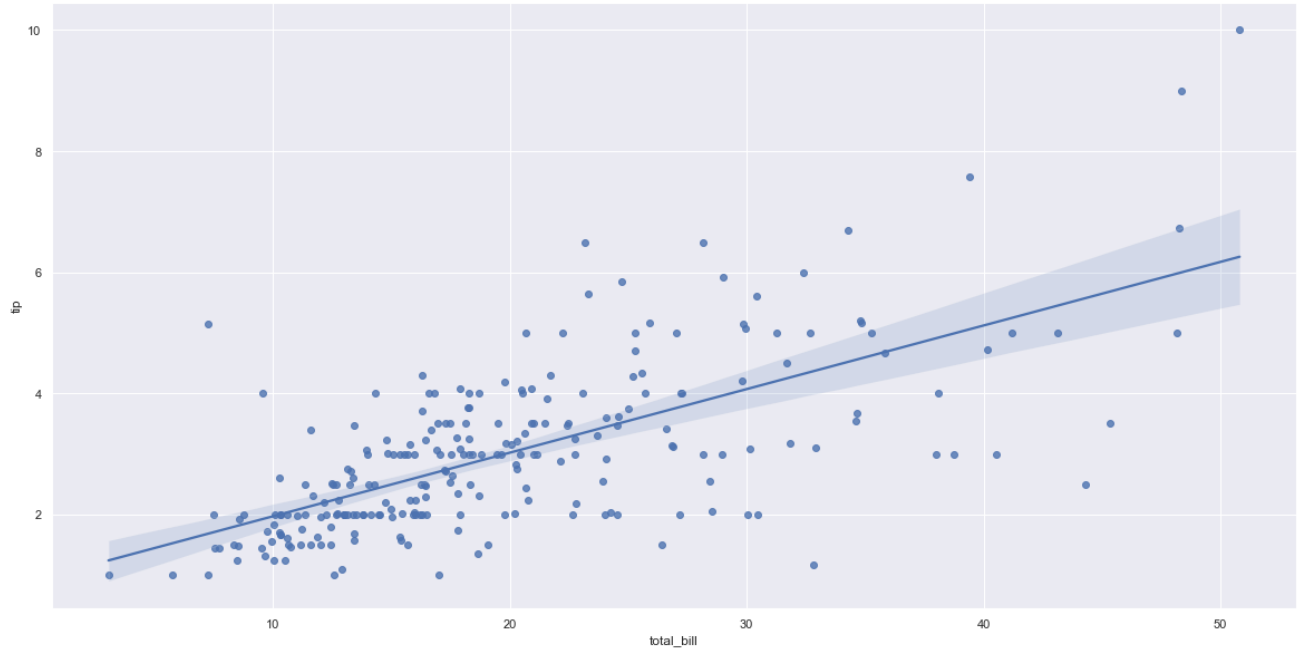



```
sns.pairplot(df1)
```

```
<seaborn.axisgrid.PairGrid at 0x294b711cd60>
```




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



df1

	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

```
import plotly.express as px
fig = px.scatter(df1, x="total_bill", y="tip", color = "time")
fig.show()
```

```
import plotly.express as px
df = px.data.iris()
fig = px.scatter(df, x="sepal_width", y="sepal_length", color="species")
fig.show()
```

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

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