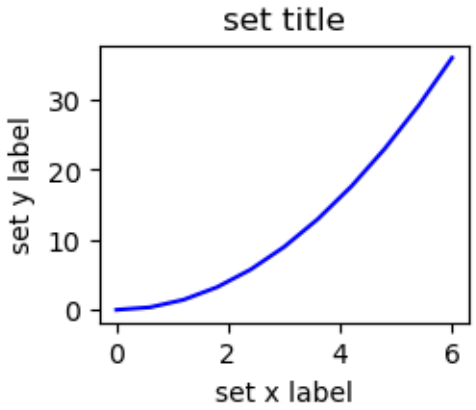
matplotlib-seaborn-kevin

April 8, 2024

[1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
x=np.linspace(0,6,11)
y=x**2
fig=plt.figure()#create figure(empty canvas)
#plot on that set of axes
axes=fig.add_axes([0.01,0.01,0.3,0.3])#left,bottom,width,height(range 0 to 1)
axes.plot(x,y,'b')
#notice the use of set_ to begin methods
axes.set_xlabel("set x label")
axes.set_ylabel("set y label")
axes.set_title("set title")
```

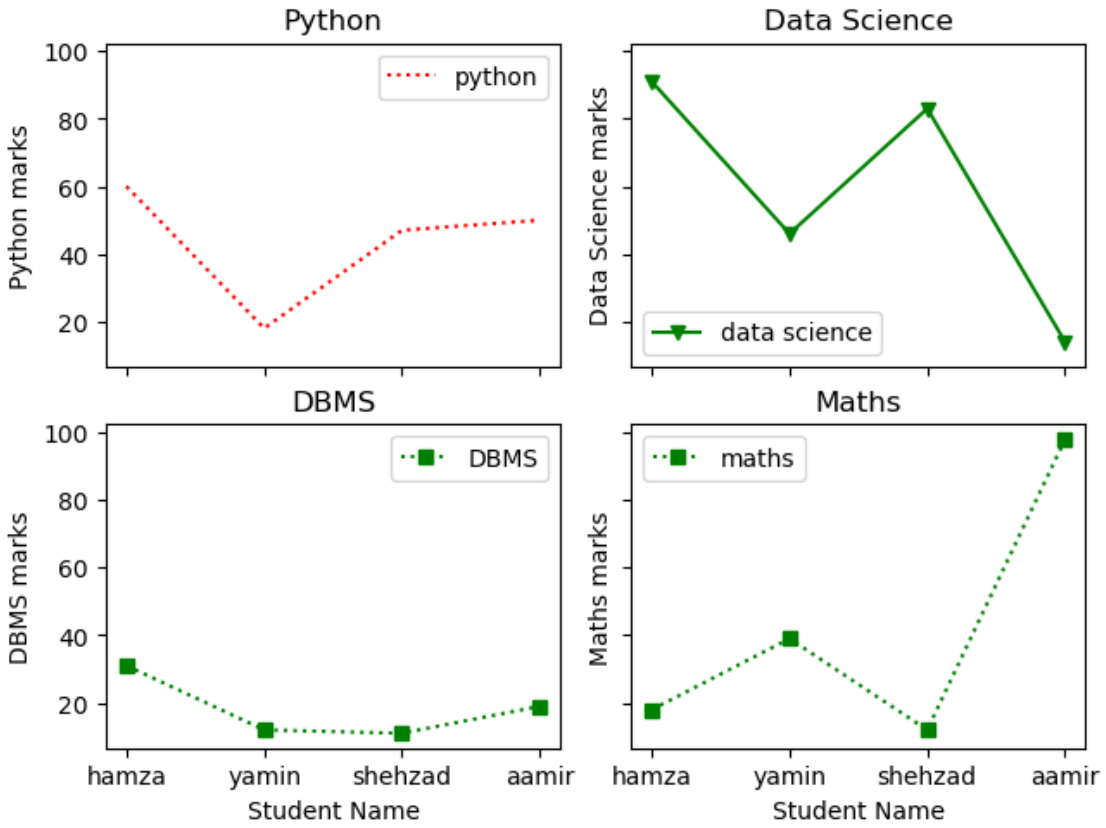
[1]:
```
Text(0.5, 1.0, 'set title')
```



[2]:
```
df=pd.DataFrame(np.random.
  ↪randint(0,100,(4,4)),index=["kevin","devang","rohan","james"],columns=["python","data_scien
df
fig2,ax=plt.subplots(2,2,sharex=True,sharey=True,layout="constrained")
ax[0,0].plot(df.index,df.python,'r',ls="dotted",label="python")
ax[0,0].set_ylabel("Python marks")
```

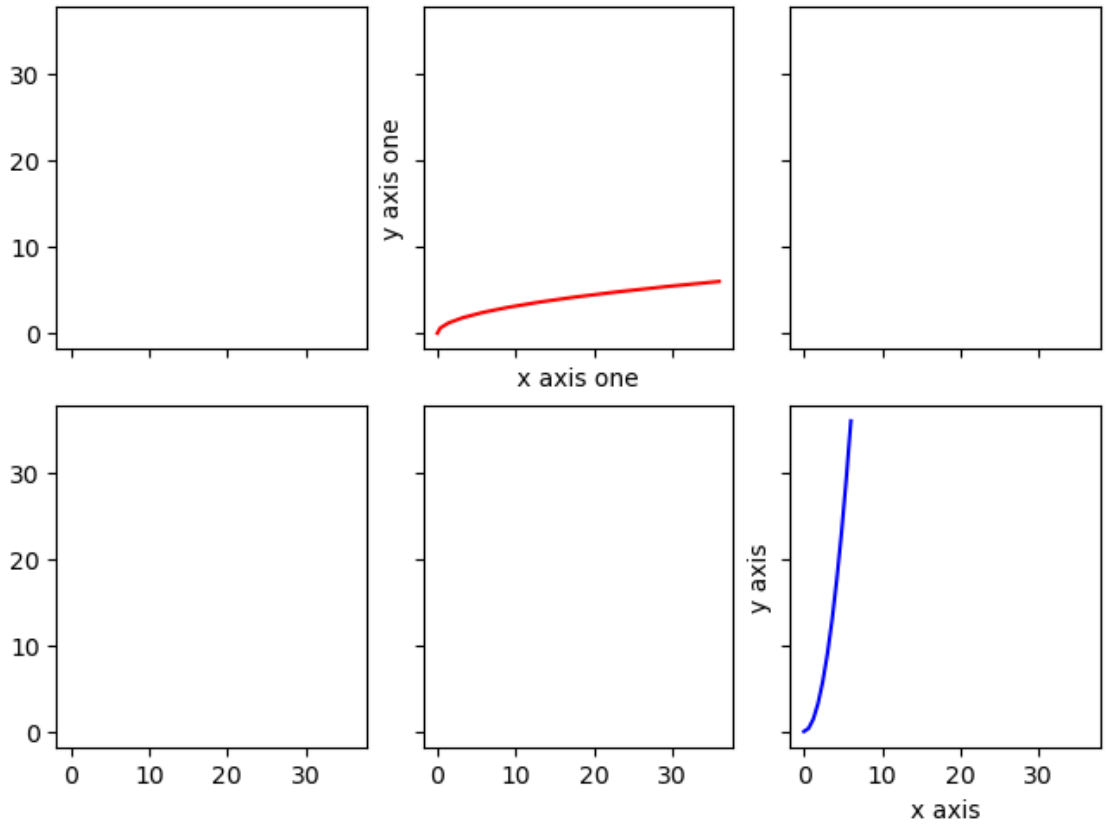
```
ax[0,0].set_title("Python")
ax[0,0].legend()
ax[0,1].plot(df.index,df.data_science,'gv-',label="data science")
ax[0,1].set_ylabel("Data Science marks")
ax[0,1].set_title("Data Science")
ax[0,1].legend(loc=3)
ax[1,0].plot(df.index,df.DBMS,'gs',linestyle="dotted",label="DBMS")
ax[1,0].set_ylabel("DBMS marks")
ax[1,0].set_xlabel("Student Name")
ax[1,0].set_title("DBMS")
ax[1,0].legend()
ax[1,1].plot(df.index,df.Maths,'gs',linestyle="dotted",label="maths")
ax[1,1].set_xlabel("Student Name")
ax[1,1].set_ylabel("Maths marks")
ax[1,1].set_title("Maths")
ax[1,1].legend()
```

[2]: <matplotlib.legend.Legend at 0x249dc2720d0>



[3]:
```
fig1,ax=plt.subplots(2,3,sharex=True,sharey=True,layout="constrained")
ax[1,2].plot(x,y,'b')
ax[0,1].plot(y,x,'r')
ax[1,2].set_xlabel("x axis")
ax[1,2].set_ylabel("y axis")
ax[0,1].set_xlabel("x axis one")
ax[0,1].set_ylabel("y axis one")
```

[3]:
```
Text(0, 0.5, 'y axis one')
```



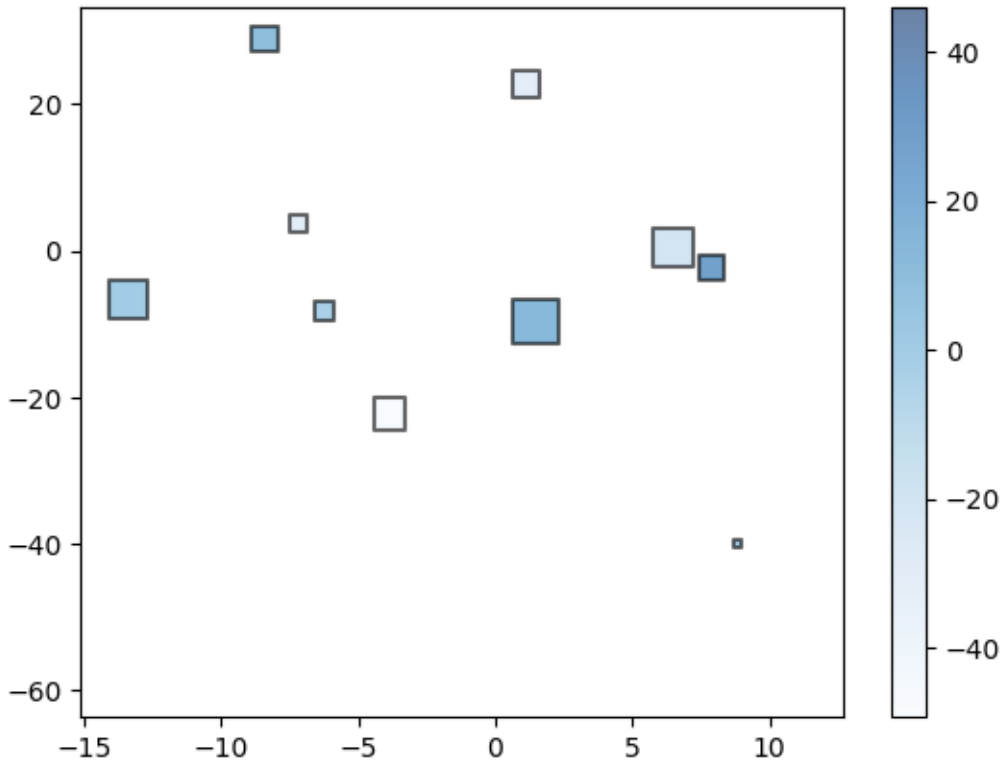
[4]:
```
x=np.random.normal(0,10,20)
y=np.random.normal(0,20,20)
s1=np.random.normal(50,200,20)
c1=np.random.normal(0,20,20)
```

[5]:
```
plt.scatter(x,y,s=s1,marker='s',c=c1,alpha=0.
  ↪6,cmap='Blues',edgecolor='k',linewidth=1.5)
plt.colorbar()
```

```
C:\Users\HP\anaconda3\Lib\site-packages\matplotlib\collections.py:963:
RuntimeWarning: invalid value encountered in sqrt
```

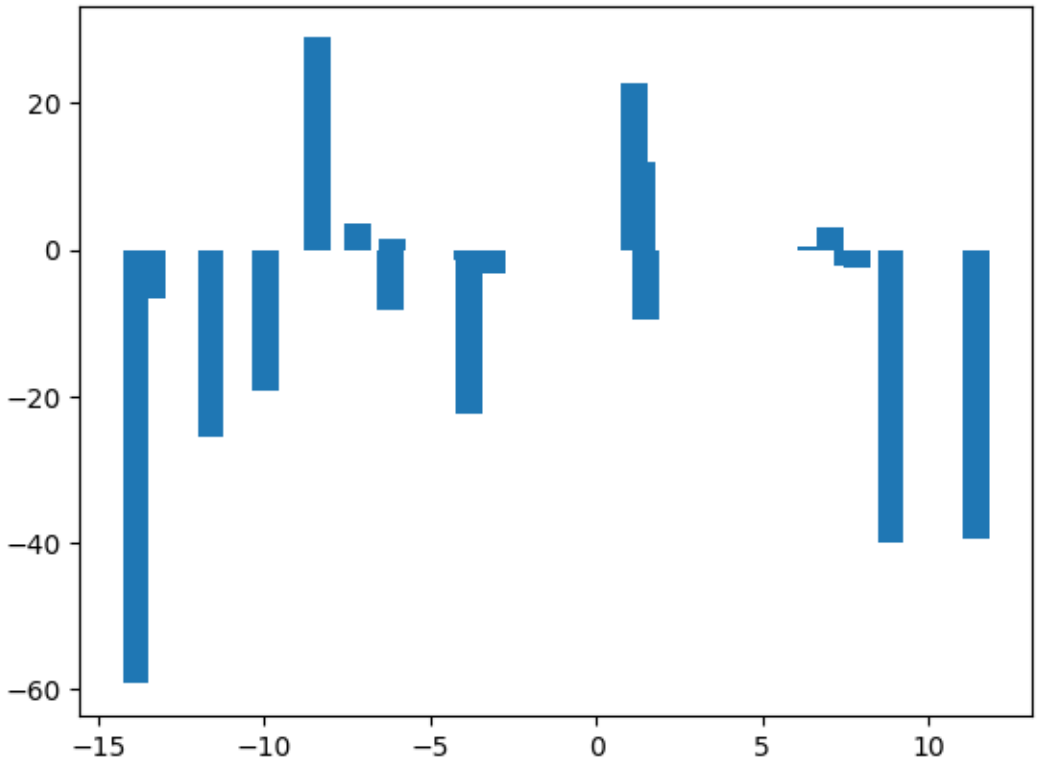
```
    scale = np.sqrt(self._sizes) * dpi / 72.0 * self._factor
```

[5]: <matplotlib.colorbar.Colorbar at 0x249dcb65810>



[6]:
```
plt.bar(x,y)
```

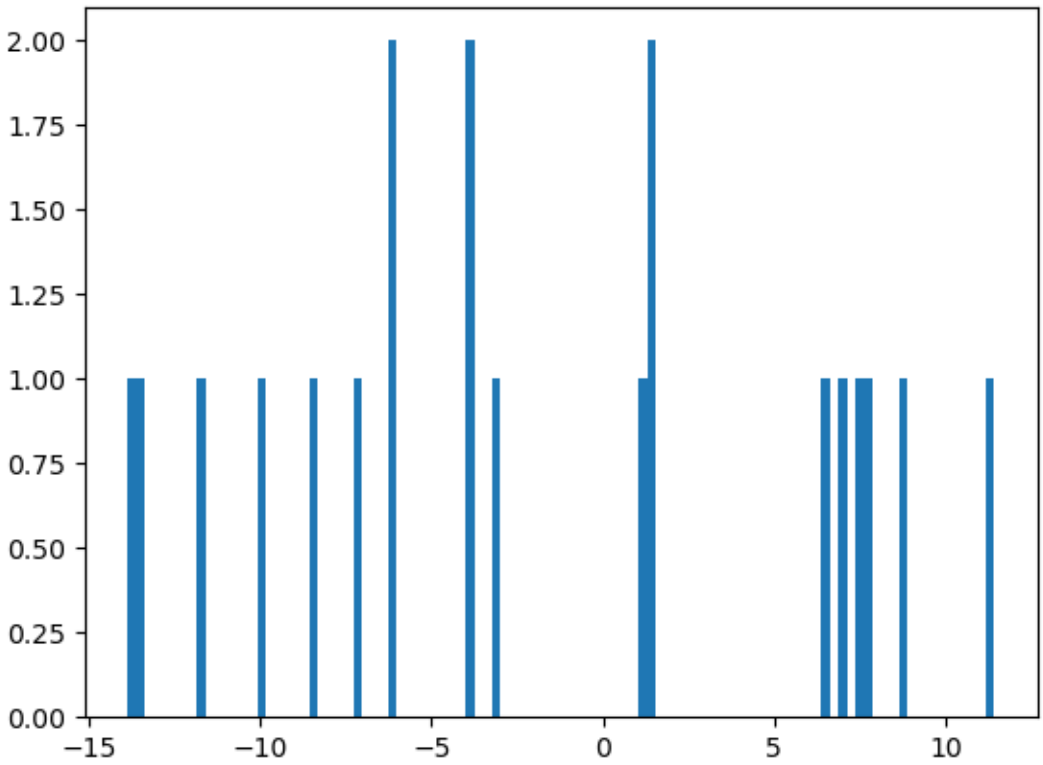
[6]: <BarContainer object of 20 artists>



[7]:
```
plt.hist(x,bins=100)
```

[7]:
```
(array([1., 1., 0., 0., 0., 0., 0., 0., 1., 0., 0., 0., 0., 0., 0., 1., 0.,
        0., 0., 0., 0., 1., 0., 0., 0., 0., 1., 0., 0., 0., 2., 0., 0., 0.,
        0., 0., 0., 0., 0., 2., 0., 0., 1., 0., 0., 0., 0., 0., 0., 0., 0.,
        0., 0., 0., 0., 0., 0., 0., 0., 1., 2., 0., 0., 0., 0., 0., 0., 0.,
        0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 1., 0., 1., 0., 1.,
        1., 0., 0., 0., 1., 0., 0., 0., 0., 0., 0., 0., 0., 0., 1.]),
 array([-13.85190231, -13.59929988, -13.34669746, -13.09409503,
        -12.84149261, -12.58889019, -12.33628776, -12.08368534,
        -11.83108291, -11.57848049, -11.32587806, -11.07327564,
        -10.82067321, -10.56807079, -10.31546836, -10.06286594,
         -9.81026352,  -9.55766109,  -9.30505867,  -9.05245624,
         -8.79985382,  -8.54725139,  -8.29464897,  -8.04204654,
         -7.78944412,  -7.53684169,  -7.28423927,  -7.03163685,
         -6.77903442,  -6.526432  ,  -6.27382957,  -6.02122715,
         -5.76862472,  -5.5160223 ,  -5.26341987,  -5.01081745,
         -4.75821502,  -4.5056126 ,  -4.25301018,  -4.00040775,
         -3.74780533,  -3.4952029 ,  -3.24260048,  -2.98999805,
         -2.73739563,  -2.4847932 ,  -2.23219078,  -1.97958835,
         -1.72698593,  -1.47438351,  -1.22178108,  -0.96917866,
         -0.71657623,  -0.46397381,  -0.21137138,   0.04123104,
```

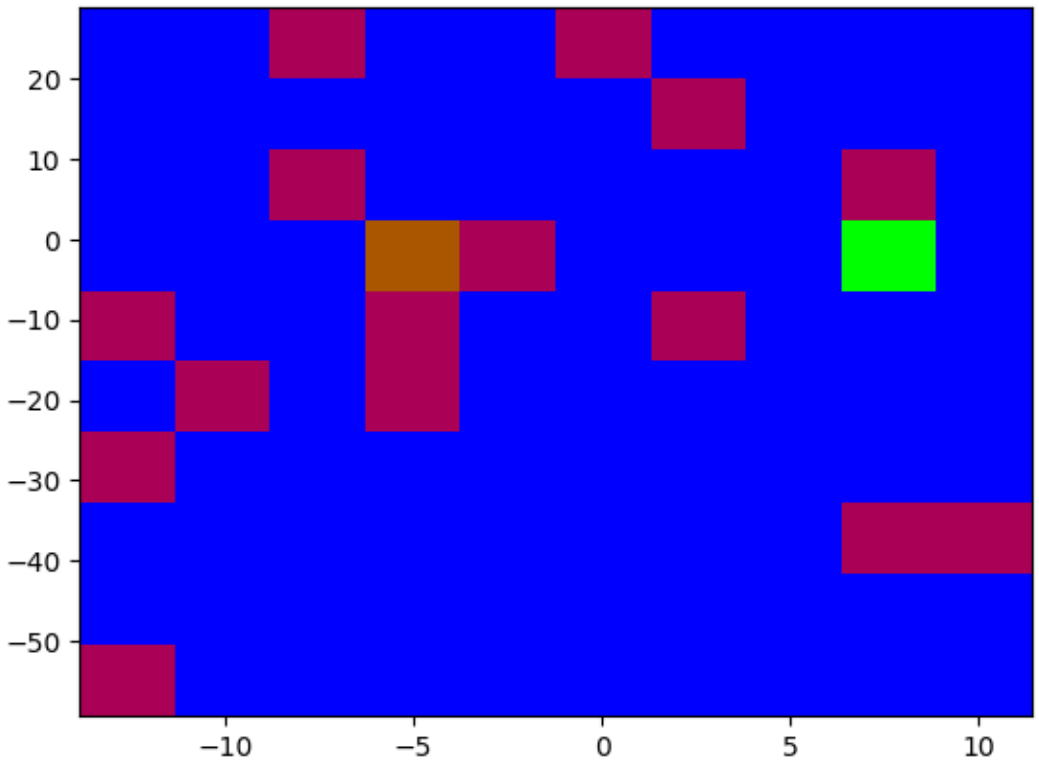
```
        0.29383347,   0.54643589,   0.79903832,   1.05164074,
        1.30424316,   1.55684559,   1.80944801,   2.06205044,
        2.31465286,   2.56725529,   2.81985771,   3.07246014,
        3.32506256,   3.57766499,   3.83026741,   4.08286983,
        4.33547226,   4.58807468,   4.84067711,   5.09327953,
        5.34588196,   5.59848438,   5.85108681,   6.10368923,
        6.35629166,   6.60889408,   6.8614965 ,   7.11409893,
        7.36670135,   7.61930378,   7.8719062 ,   8.12450863,
        8.37711105,   8.62971348,   8.8823159 ,   9.13491833,
        9.38752075,   9.64012317,   9.8927256 ,  10.14532802,
       10.39793045,  10.65053287,  10.9031353 ,  11.15573772,
       11.40834015]),
<BarContainer object of 100 artists>)
```



[8]:
```
plt.hist2d(x,y,bins=10,cmap='brg')
```

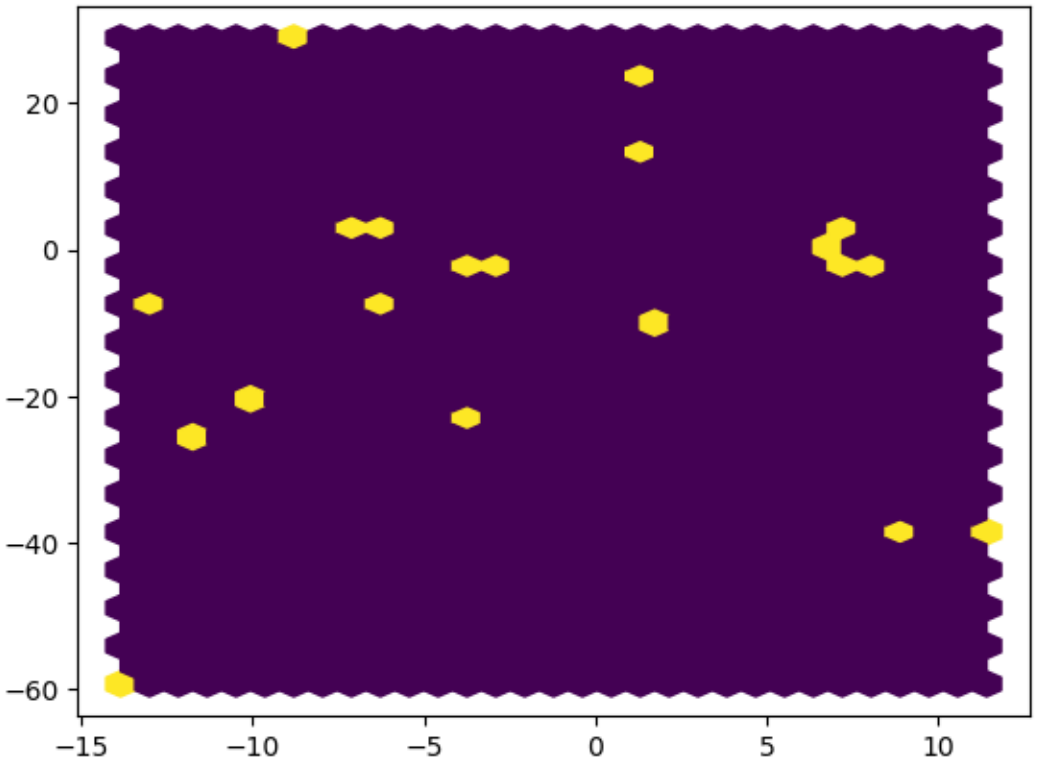
[8]:
```
(array([[1., 0., 0., 1., 0., 1., 0., 0., 0., 0.],
        [0., 0., 0., 0., 1., 0., 0., 0., 0., 0.],
        [0., 0., 0., 0., 0., 0., 0., 1., 0., 1.],
        [0., 0., 0., 0., 1., 1., 2., 0., 0., 0.],
        [0., 0., 0., 0., 0., 0., 1., 0., 0., 0.],
        [0., 0., 0., 0., 0., 0., 0., 0., 0., 1.],
```

```
       [0., 0., 0., 0., 0., 1., 0., 0., 1., 0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
       [0., 0., 1., 0., 0., 0., 3., 1., 0., 0.],
       [0., 0., 1., 0., 0., 0., 0., 0., 0., 0.]]),
array([-13.85190231, -11.32587806,  -8.79985382,  -6.27382957,
        -3.74780533,  -1.22178108,   1.30424316,   3.83026741,
         6.35629166,   8.8823159 ,  11.40834015]),
array([-59.34624118, -50.51880164, -41.69136209, -32.86392255,
       -24.03648301, -15.20904347,  -6.38160393,   2.44583561,
        11.27327516,  20.1007147 ,  28.92815424]),
<matplotlib.collections.QuadMesh at 0x249dcd46810>)
```



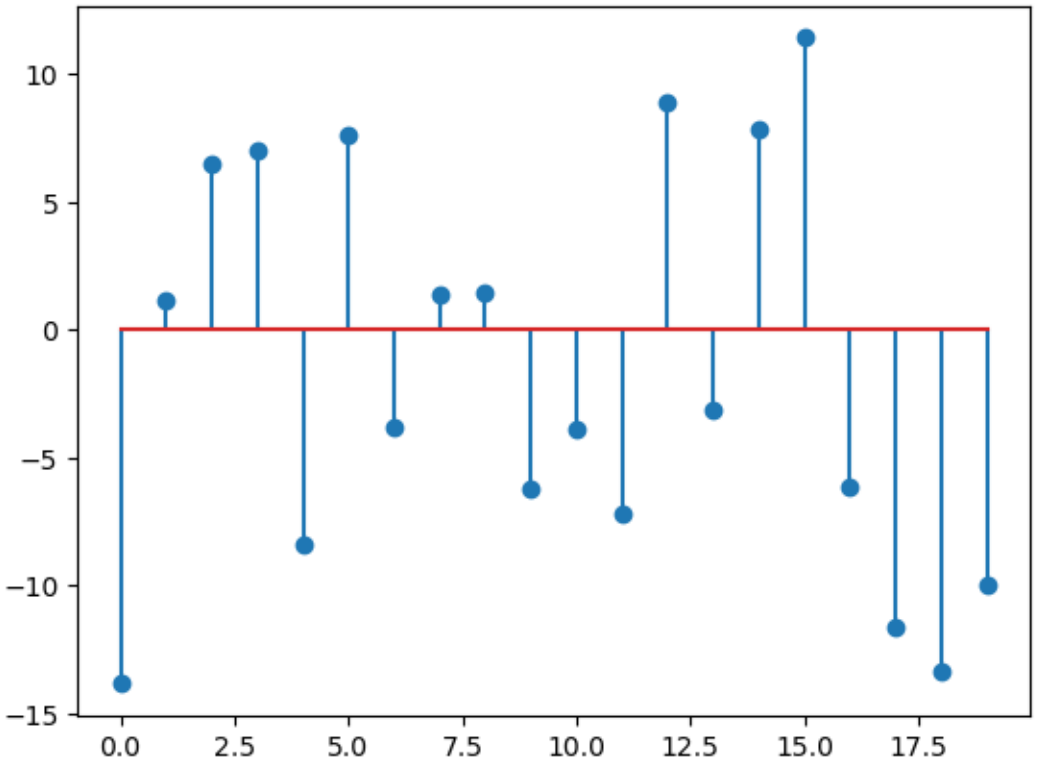
[9]:
```
plt.hexbin(x,y,gridsize=30)
```

[9]:
```
<matplotlib.collections.PolyCollection at 0x249dd0c9110>
```



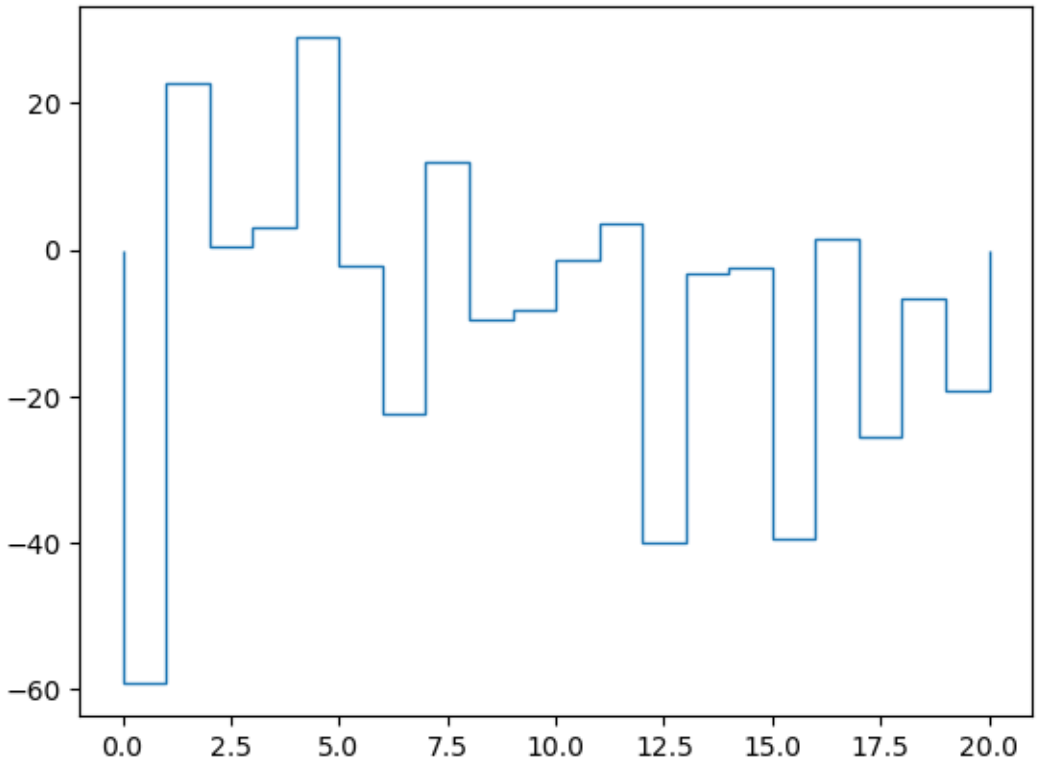
[10]:
```
plt.stem(x)
```

[10]: <StemContainer object of 3 artists>



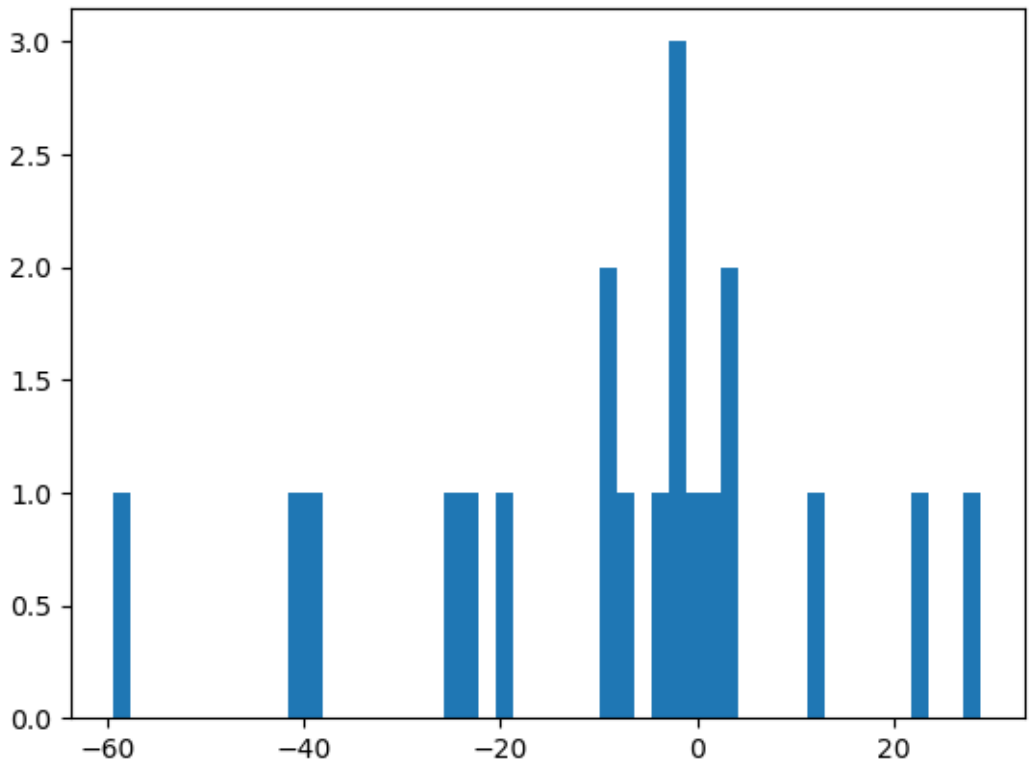
[11]:
```
plt.stairs(y)
```

[11]:
```
<matplotlib.patches.StepPatch at 0x249dd485590>
```



[13]:
```
plt.hist(y,bins=50,histtype='stepfilled')
```

[13]:
```
(array([1., 0., 0., 0., 0., 0., 0., 0., 0., 0., 1., 1., 0., 0., 0., 0., 0.,
        0., 0., 1., 1., 0., 1., 0., 0., 0., 0., 0., 2., 1., 0., 1., 3., 1.,
        1., 2., 0., 0., 0., 0., 1., 0., 0., 0., 0., 0., 1., 0., 0., 1.]),
 array([-59.34624118, -57.58075327, -55.81526536, -54.04977745,
        -52.28428954, -50.51880164, -48.75331373, -46.98782582,
        -45.22233791, -43.45685   , -41.69136209, -39.92587419,
        -38.16038628, -36.39489837, -34.62941046, -32.86392255,
        -31.09843464, -29.33294674, -27.56745883, -25.80197092,
        -24.03648301, -22.2709951 , -20.50550719, -18.74001929,
        -16.97453138, -15.20904347, -13.44355556, -11.67806765,
         -9.91257974,  -8.14709184,  -6.38160393,  -4.61611602,
         -2.85062811,  -1.0851402 ,   0.68034771,   2.44583561,
          4.21132352,   5.97681143,   7.74229934,   9.50778725,
         11.27327516,  13.03876307,  14.80425097,  16.56973888,
         18.33522679,  20.1007147 ,  21.86620261,  23.63169052,
         25.39717842,  27.16266633,  28.92815424]),
 <matplotlib.patches.Polygon at 0x249e24fe250>])
```

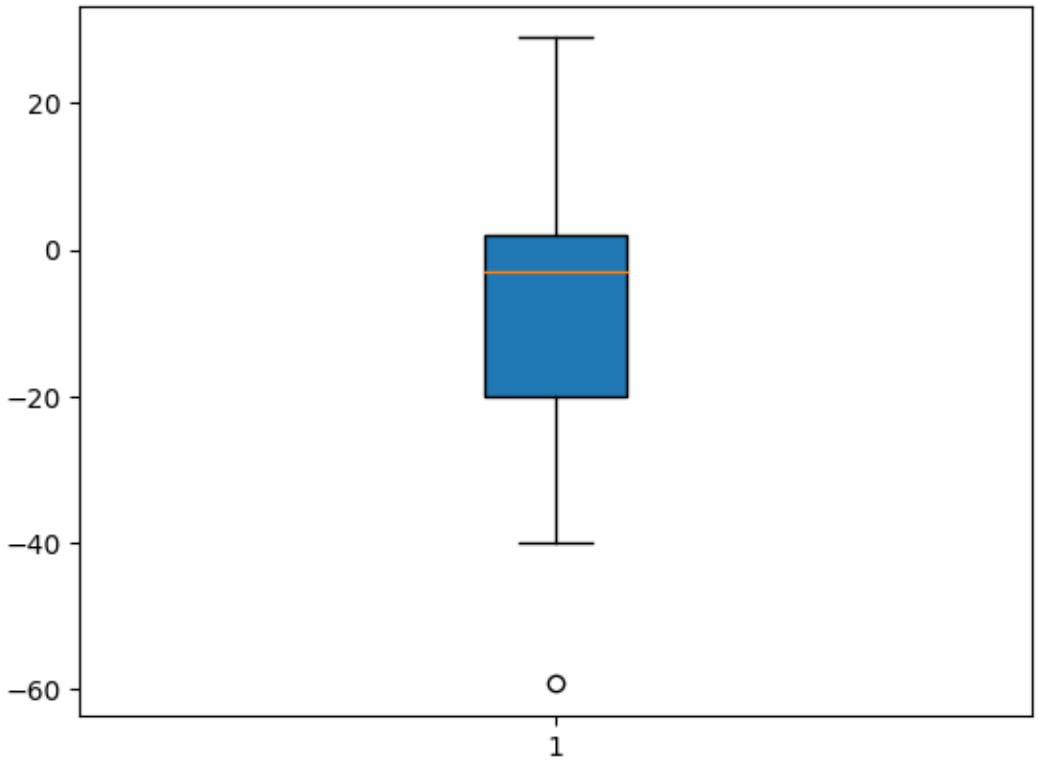


[14]:
```
x=[1,2,3,4]
plt.pie(x,explode=(0.1,0,0.1,0))
```

[14]:
```
([<matplotlib.patches.Wedge at 0x249de8e5590>,
  <matplotlib.patches.Wedge at 0x249e25b7e10>,
  <matplotlib.patches.Wedge at 0x249e25c8c50>,
  <matplotlib.patches.Wedge at 0x249e25c9d10>],
 [Text(1.1412678178182487, 0.3708203985925972, ''),
  Text(0.33991867422268784, 1.0461621742897658, ''),
  Text(-1.1412678438572794, 0.37082031845269275, ''),
  Text(0.3399188211458418, -1.0461621265515308, '')])
```

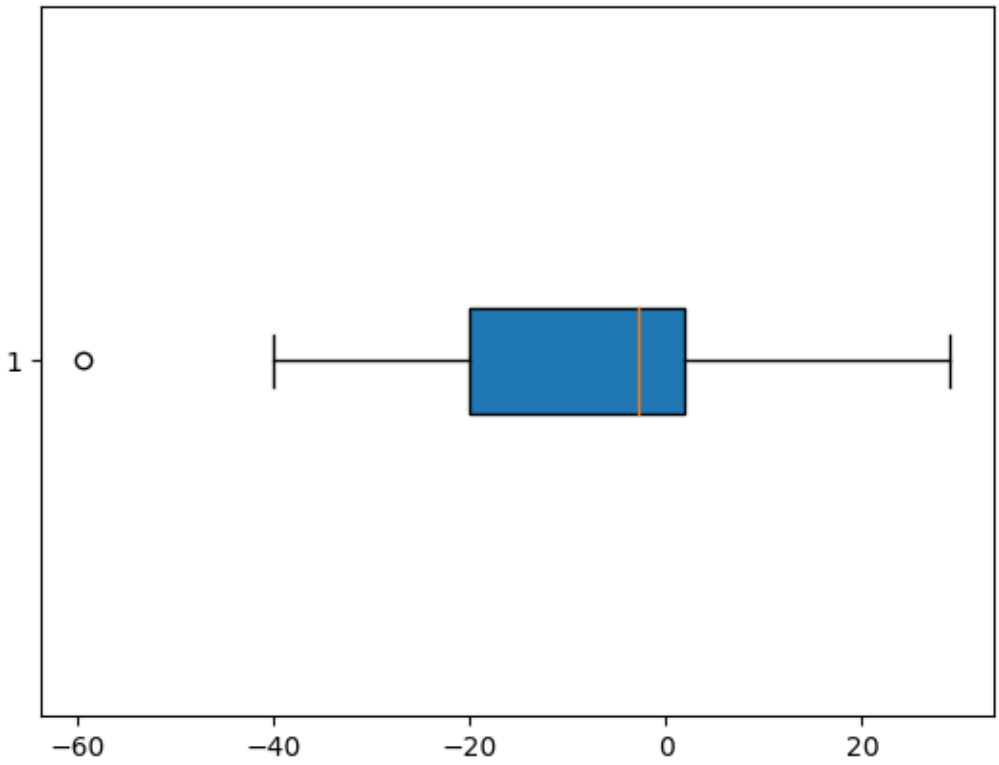
[15]:
```
plt.boxplot(y,vert=True,patch_artist=True)
```

[15]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x249de4b04d0>,
  <matplotlib.lines.Line2D at 0x249e2602950>],
 'caps': [<matplotlib.lines.Line2D at 0x249e26032d0>,
  <matplotlib.lines.Line2D at 0x249e2603bd0>],
 'boxes': [<matplotlib.patches.PathPatch at 0x249de8e7010>],
 'medians': [<matplotlib.lines.Line2D at 0x249e2614450>],
 'fliers': [<matplotlib.lines.Line2D at 0x249e24ffc90>],
 'means': []}
```



[16]:
```
plt.boxplot(y,vert=False,patch_artist=True)
```

[16]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x249e266c190>,
  <matplotlib.lines.Line2D at 0x249e266c750>],
 'caps': [<matplotlib.lines.Line2D at 0x249e266c050>,
  <matplotlib.lines.Line2D at 0x249e266d890>],
 'boxes': [<matplotlib.patches.PathPatch at 0x249e2663090>],
 'medians': [<matplotlib.lines.Line2D at 0x249e266e150>],
 'fliers': [<matplotlib.lines.Line2D at 0x249df9369d0>],
 'means': []}
```



Seaborn library for data visualisation distplot=density+histogram and it is univariant and it combines histogram with kernel density estimation plot(KDE) plot. jointplot=visualise the joint distribution of two variables along with their individual distribution pairplot=useful for exploring relationships in multivariate datasets,shows pairwise reationship between variables in dataset rugplot=displays individual data points along a single axis kdeplot=estimates probability density function of a continuous random variable

[17]:
```
import seaborn as sns
```

[18]:
```
tips=sns.load_dataset('tips')
tips.head()
```

[18]:

	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

[19]:
```
sns.distplot(tips['total_bill'])
```

```
C:\Users\HP\AppData\Local\Temp\ipykernel_544\4271412032.py:1: UserWarning:
```

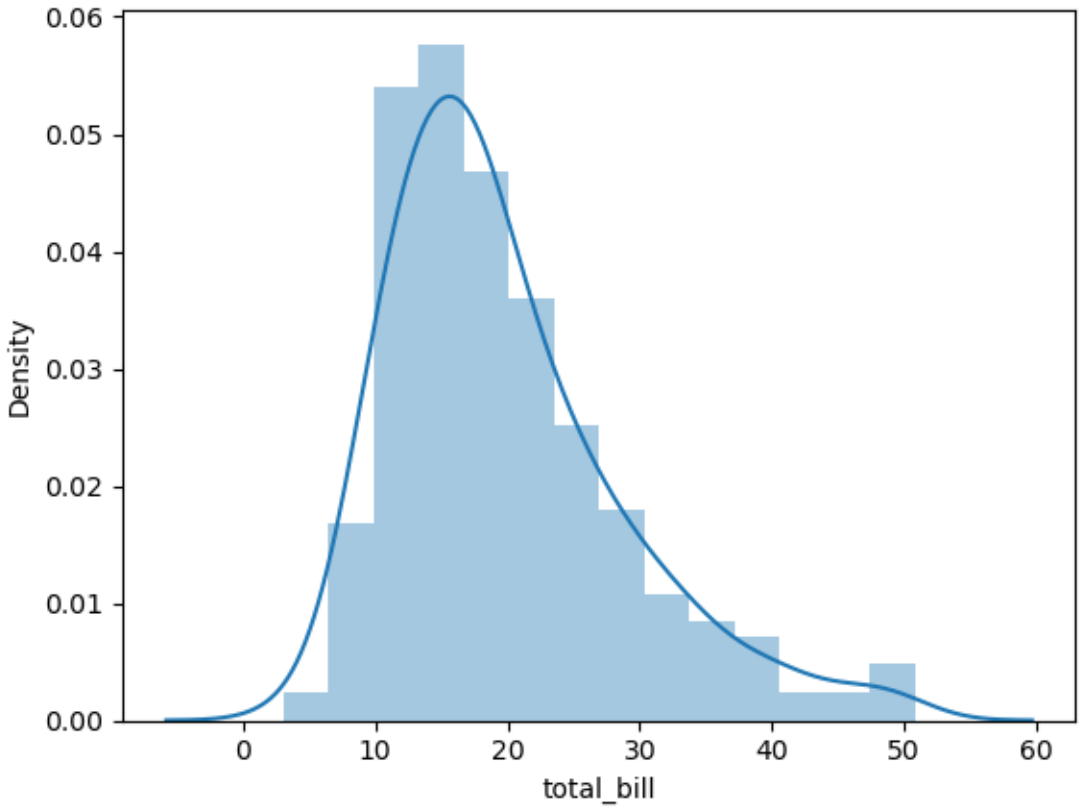
```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(tips['total_bill'])
```

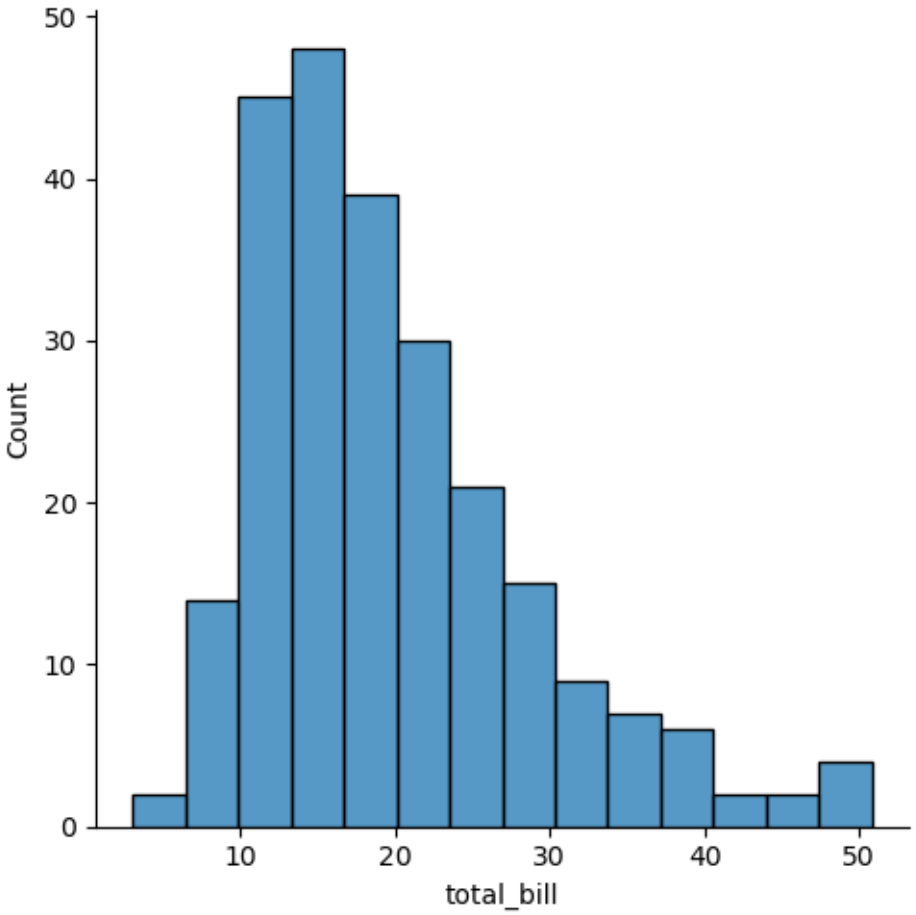
[19]: <Axes: xlabel='total_bill', ylabel='Density'>



[20]:
```
sns.displot(tips['total_bill'])
```

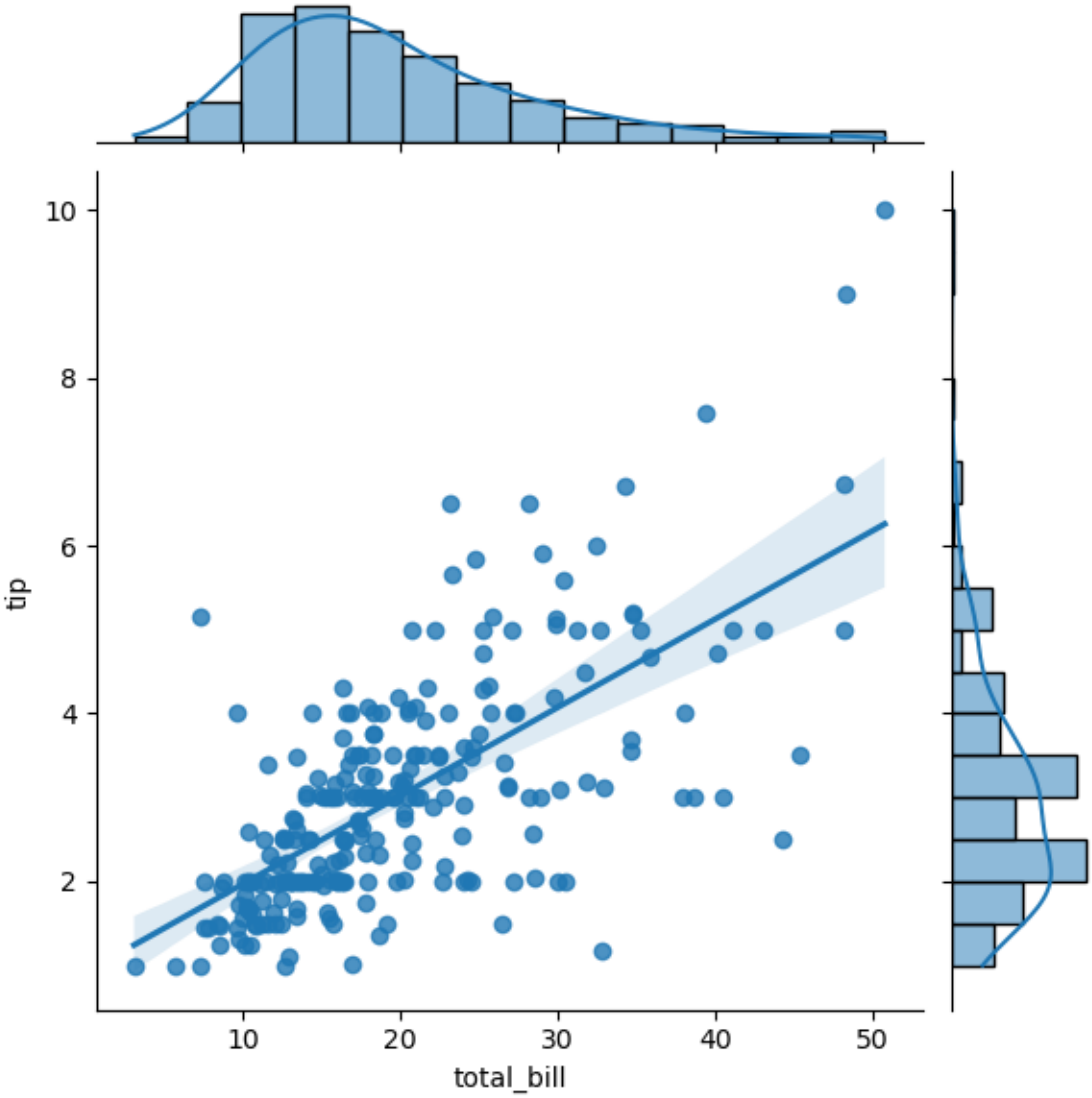
```
C:\Users\HP\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning:
The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

[20]: <seaborn.axisgrid.FacetGrid at 0x249e3e4f750>



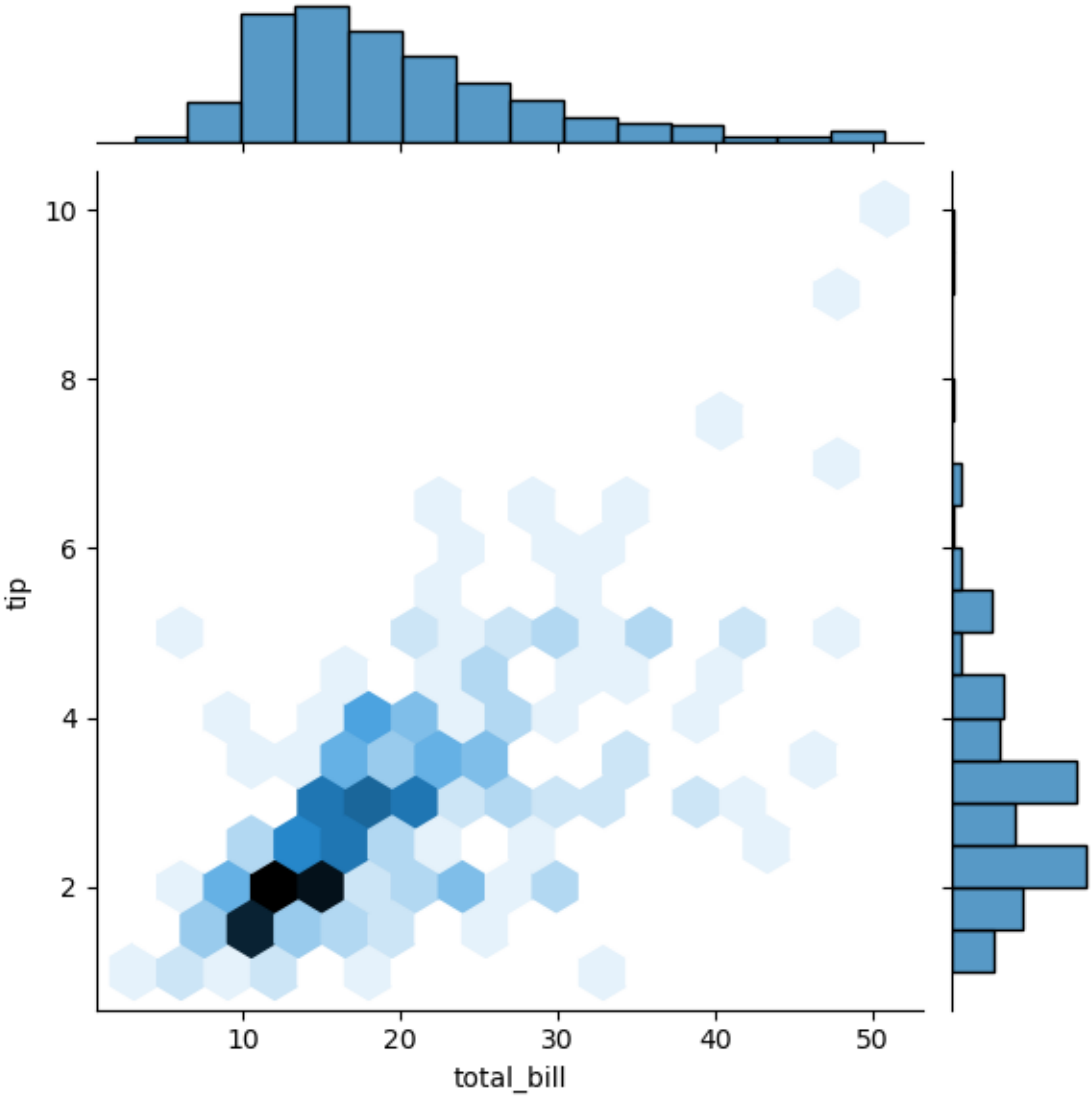
[21]:
```
sns.jointplot(x='total_bill',y='tip',data=tips,kind='reg')
```

[21]:
```
<seaborn.axisgrid.JointGrid at 0x249e3e6a690>
```



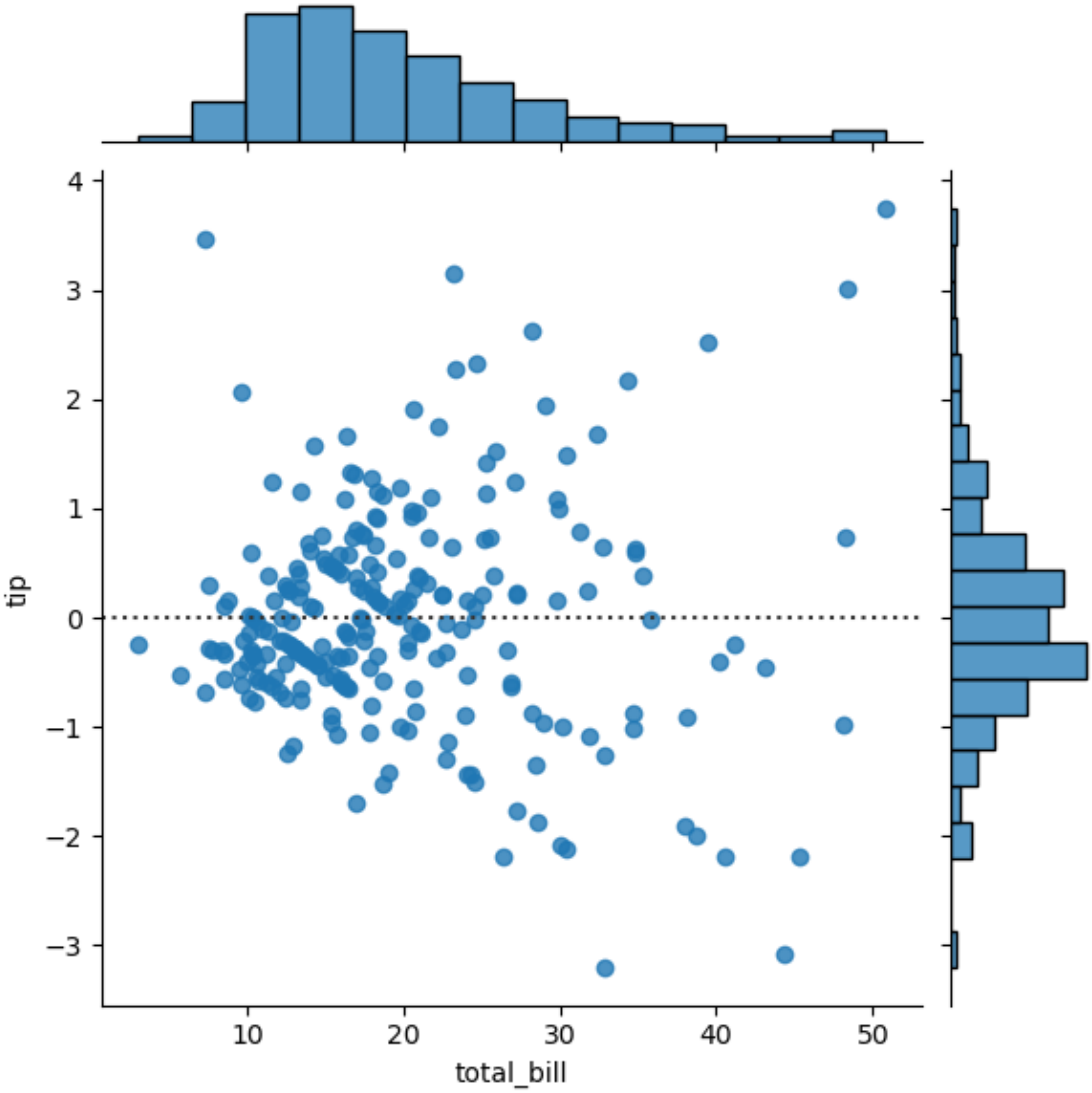
[22]:
```
sns.jointplot(x='total_bill',y='tip',data=tips,kind='hex')
```

[22]:
```
<seaborn.axisgrid.JointGrid at 0x249e2682fd0>
```



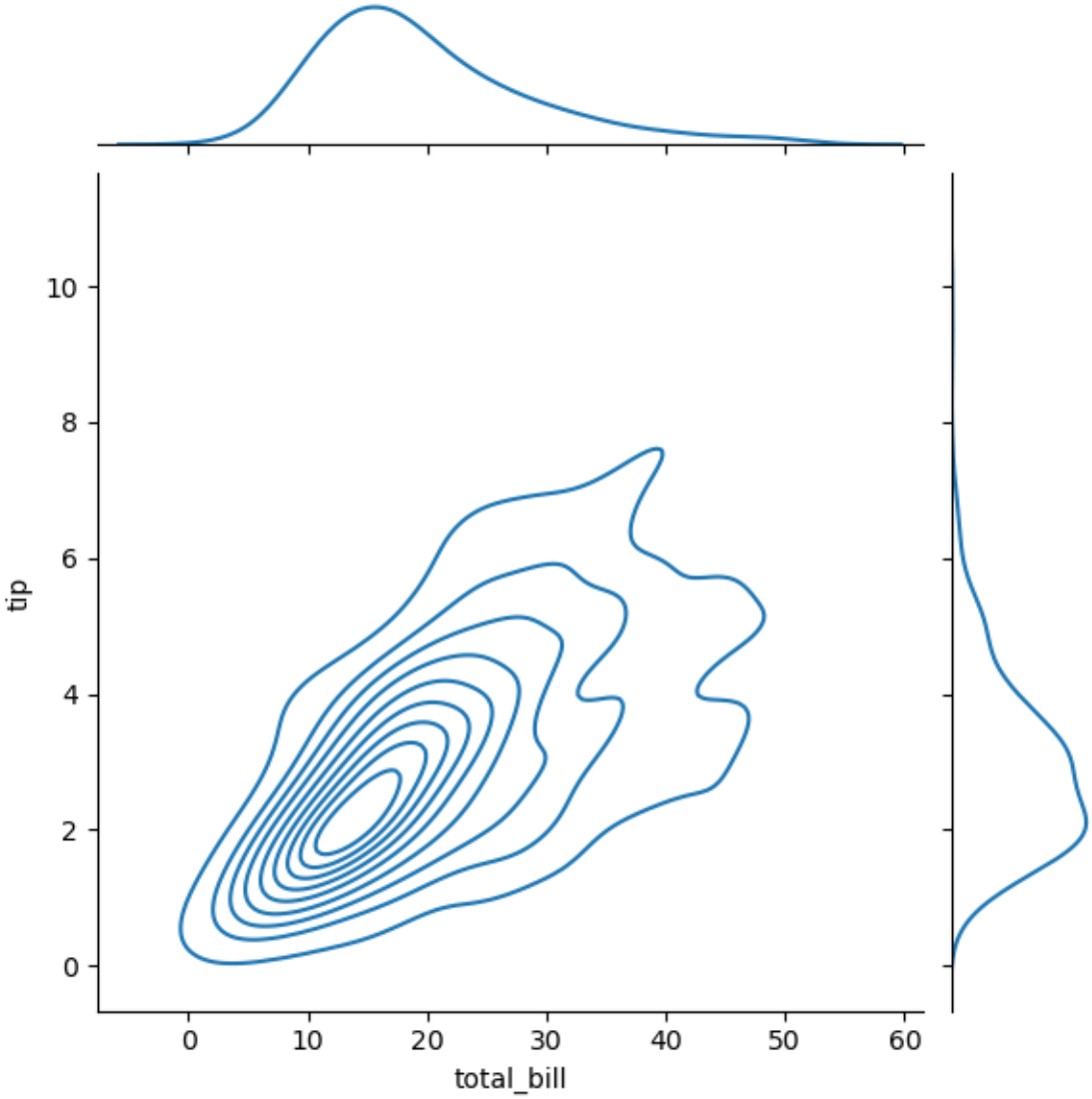
[23]:
```
sns.jointplot(x='total_bill',y='tip',data=tips,kind='resid')
```

[23]:
```
<seaborn.axisgrid.JointGrid at 0x249e5c94e10>
```



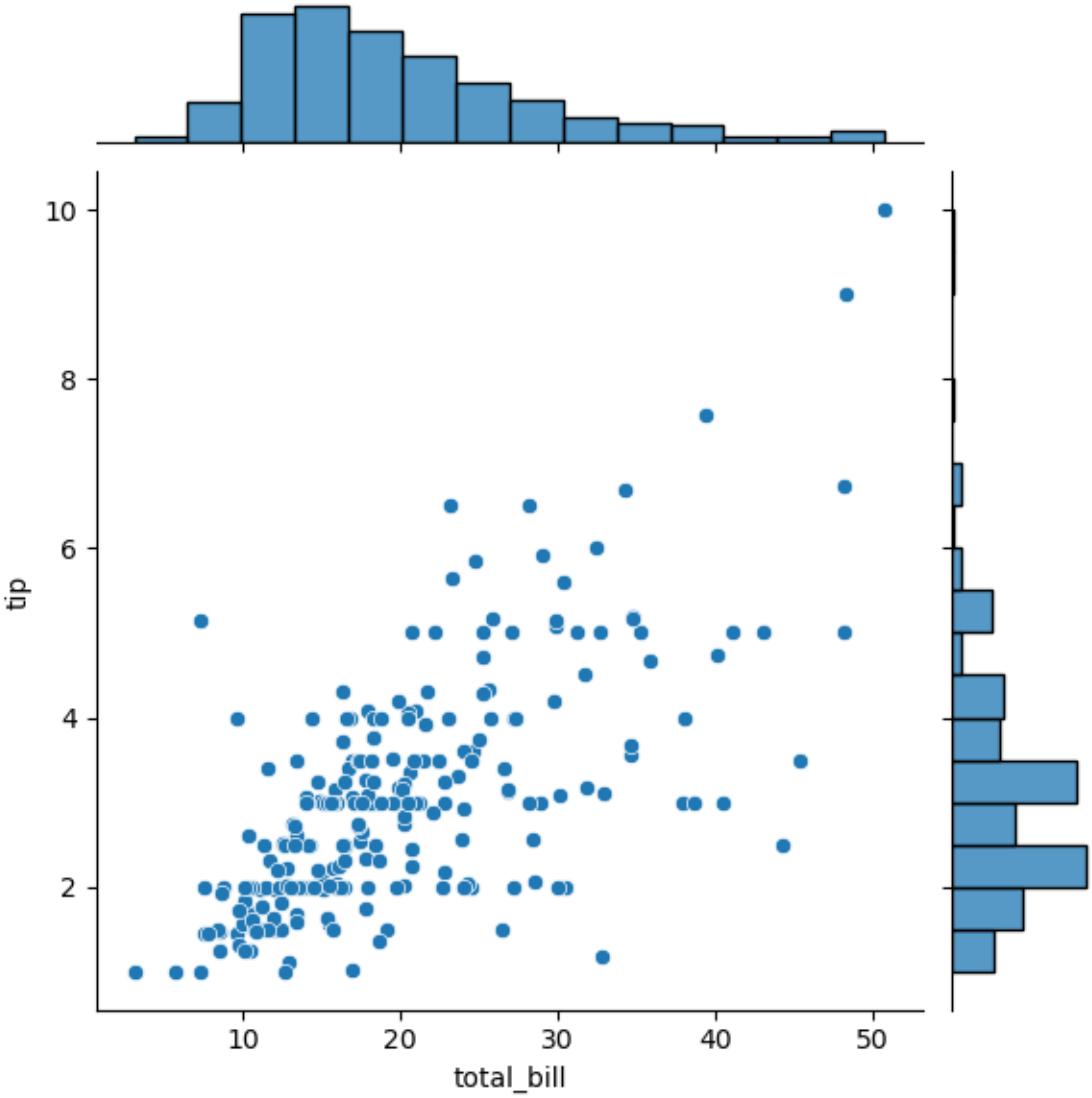
[24]:
```
sns.jointplot(x='total_bill',y='tip',data=tips,kind='kde')
```

[24]:
```
<seaborn.axisgrid.JointGrid at 0x249e39ff310>
```



[25]:
```
sns.jointplot(x='total_bill',y='tip',data=tips,kind='scatter')
```

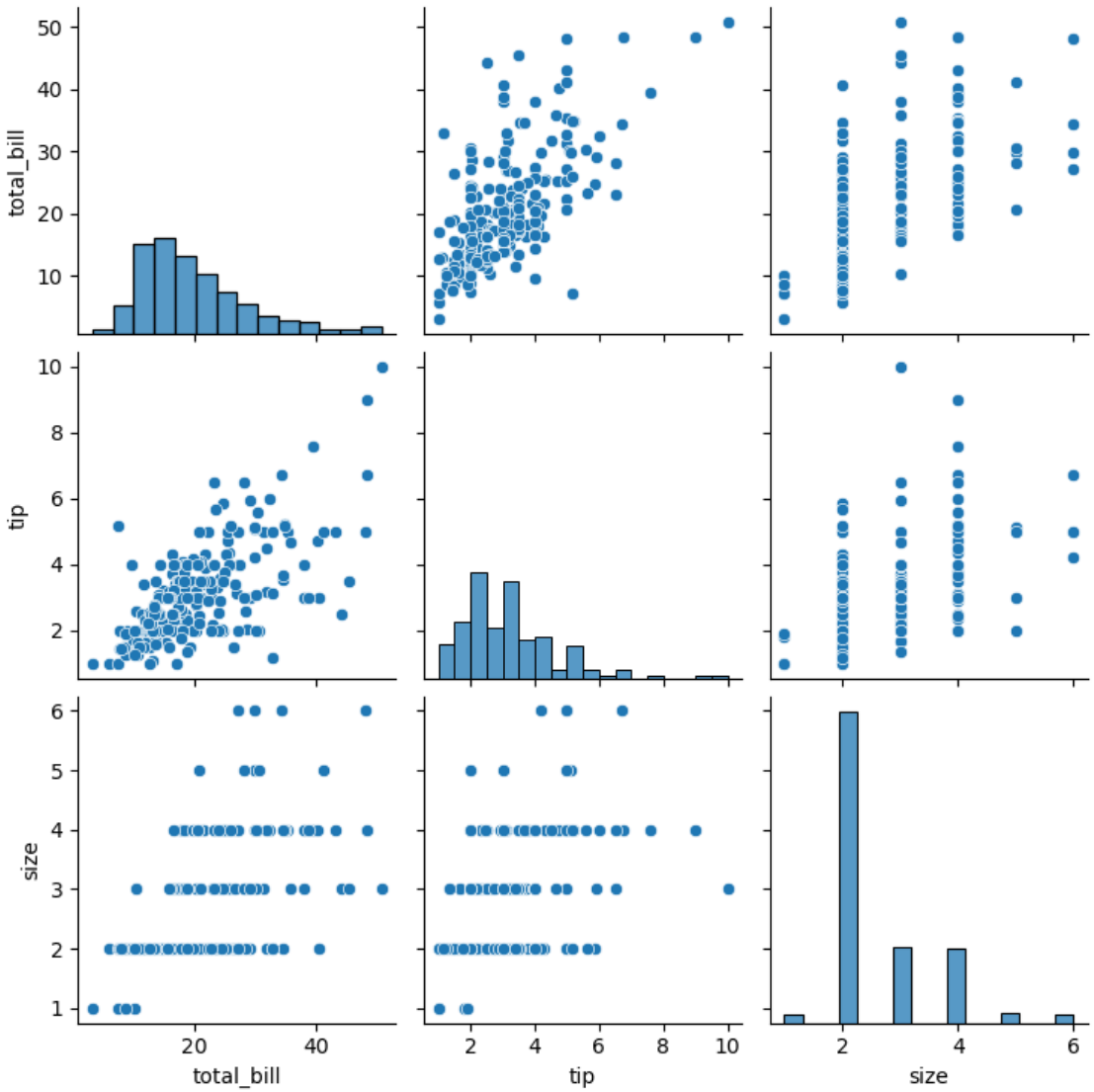
[25]: <seaborn.axisgrid.JointGrid at 0x249e655b410>



[26]:
```
sns.pairplot(tips)
```

```
C:\Users\HP\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning:
The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

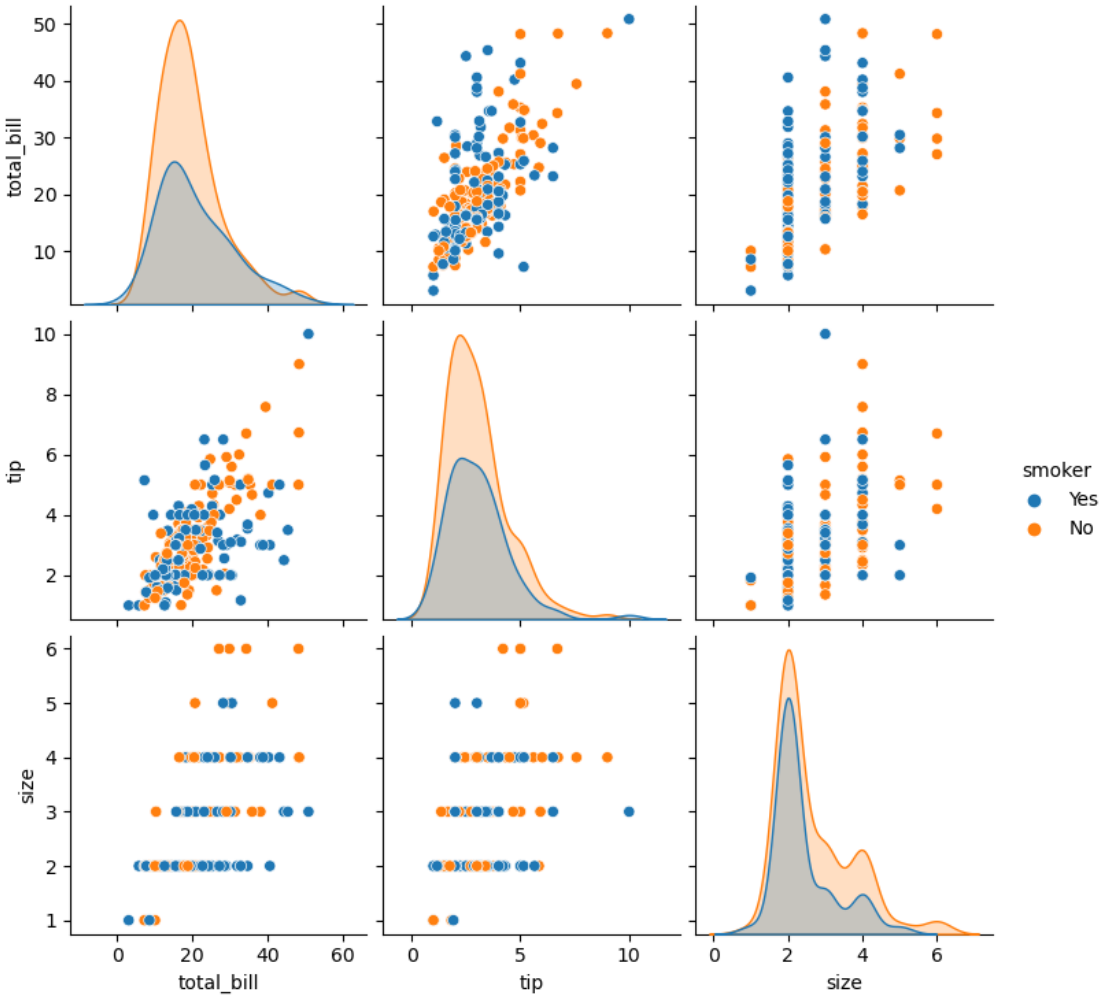
[26]:
```
<seaborn.axisgrid.PairGrid at 0x249e5f3c950>
```



[27]:
```
sns.pairplot(tips,hue='smoker')
```

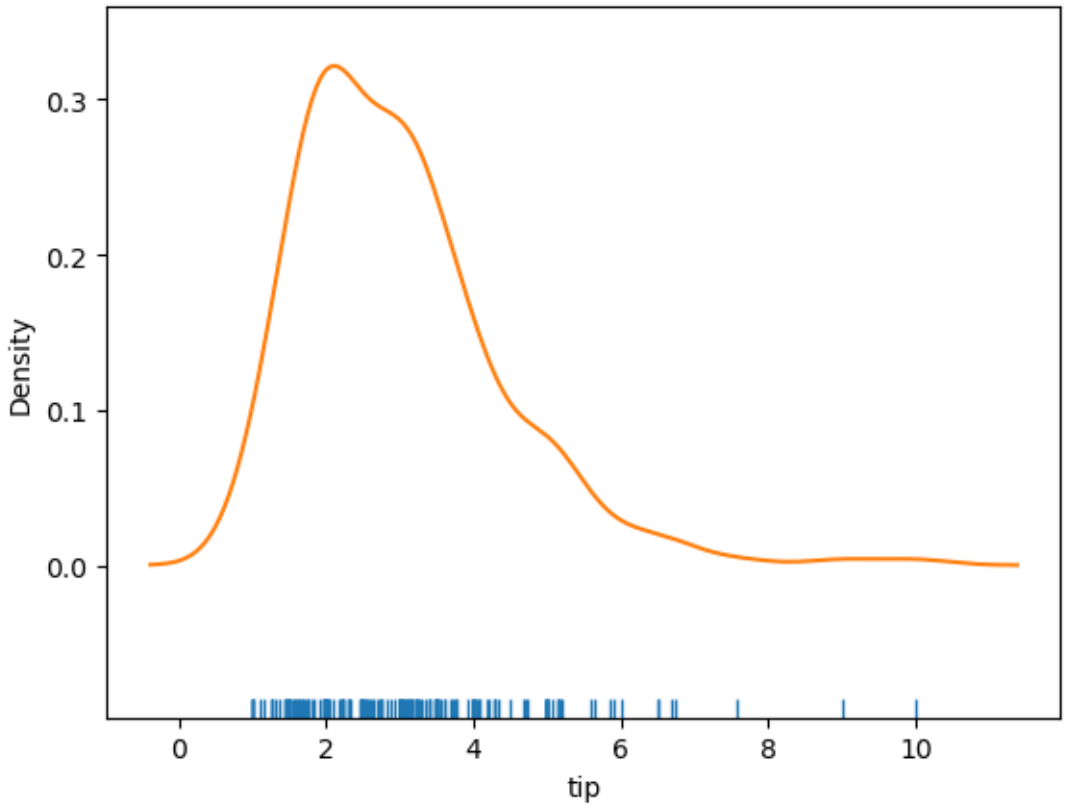
```
C:\Users\HP\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning:
The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

[27]: <seaborn.axisgrid.PairGrid at 0x249e7364610>



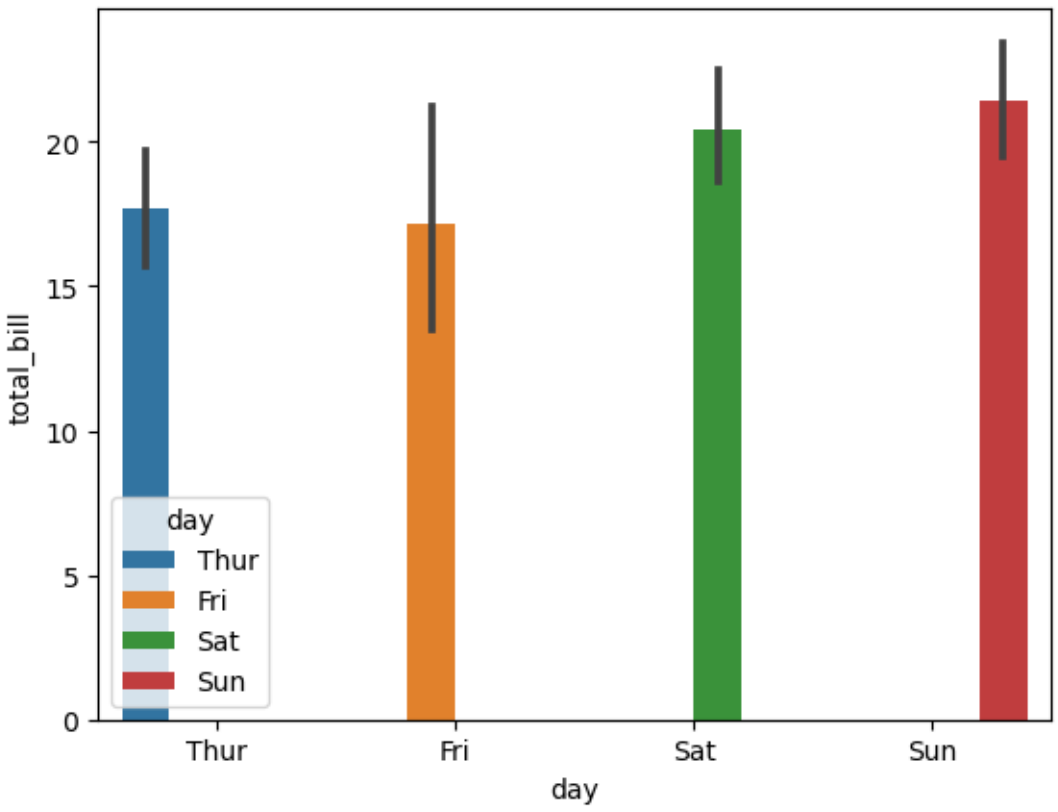
[28]:
```
sns.rugplot(tips['tip'])
sns.kdeplot(tips['tip'])
```

[28]: <Axes: xlabel='tip', ylabel='Density'>



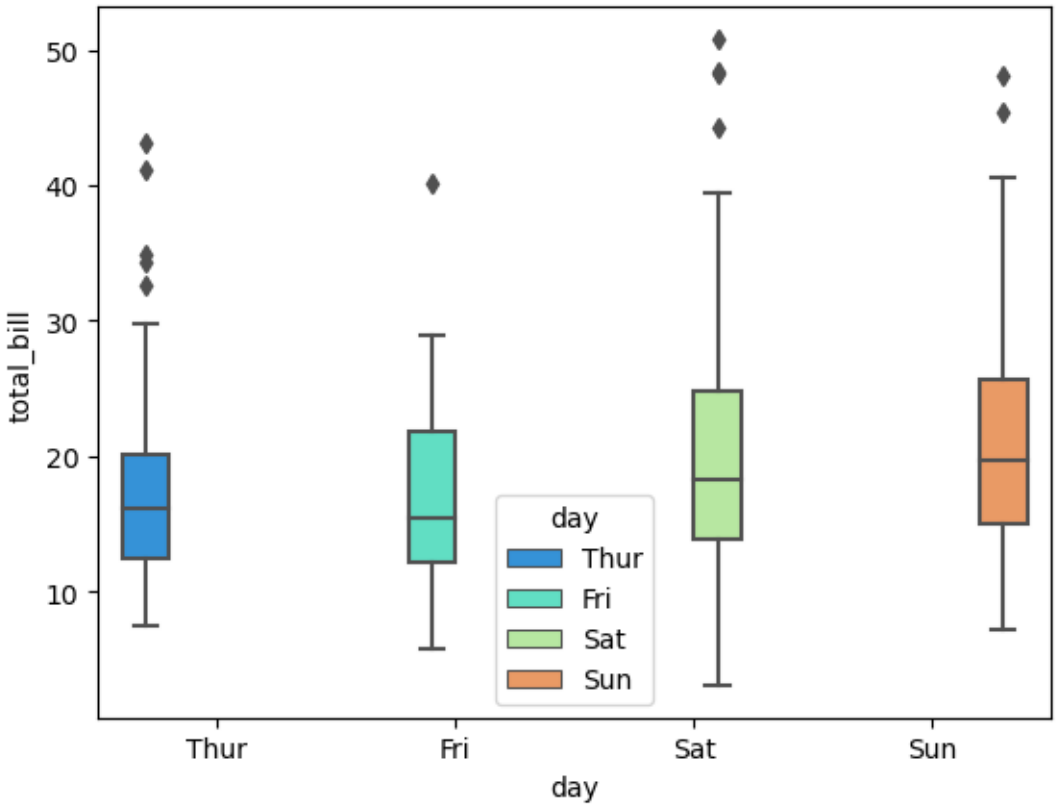
[29]:
```
sns.barplot(x='day',y='total_bill',data=tips,hue='day')
```

[29]:
```
<Axes: xlabel='day', ylabel='total_bill'>
```



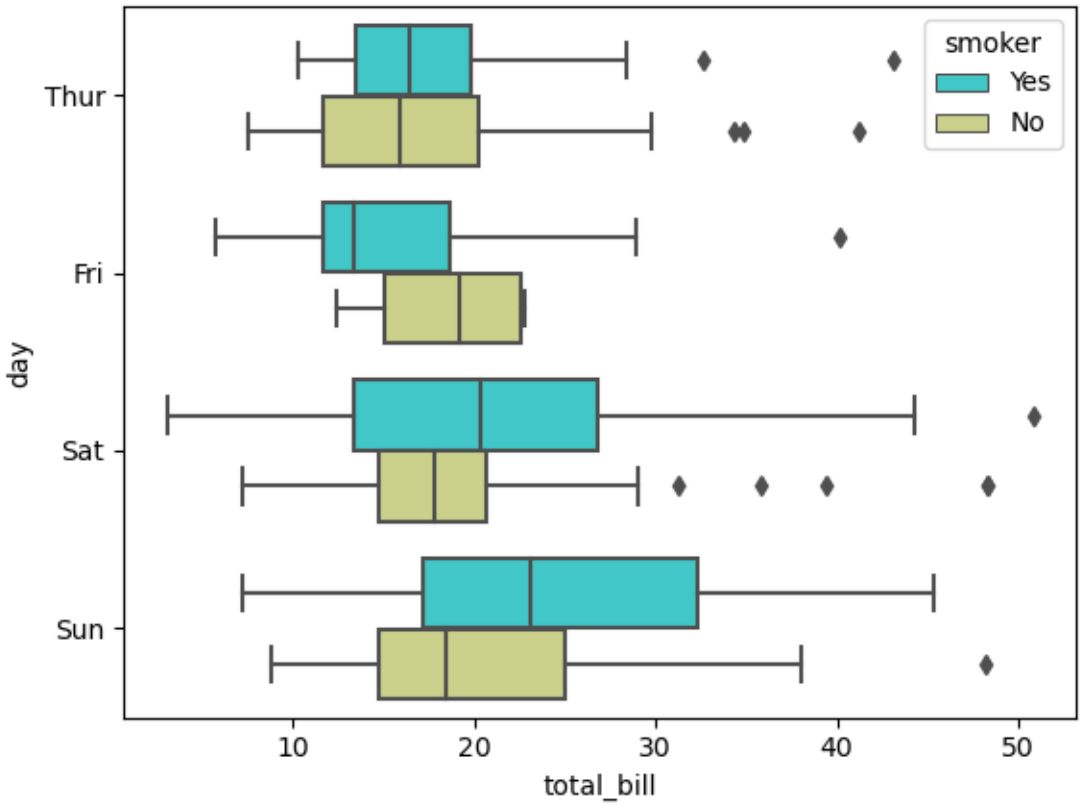
[30]:
```
sns.boxplot(x='day',y='total_bill',data=tips,palette='rainbow',hue='day')
```

[30]:
```
<Axes: xlabel='day', ylabel='total_bill'>
```



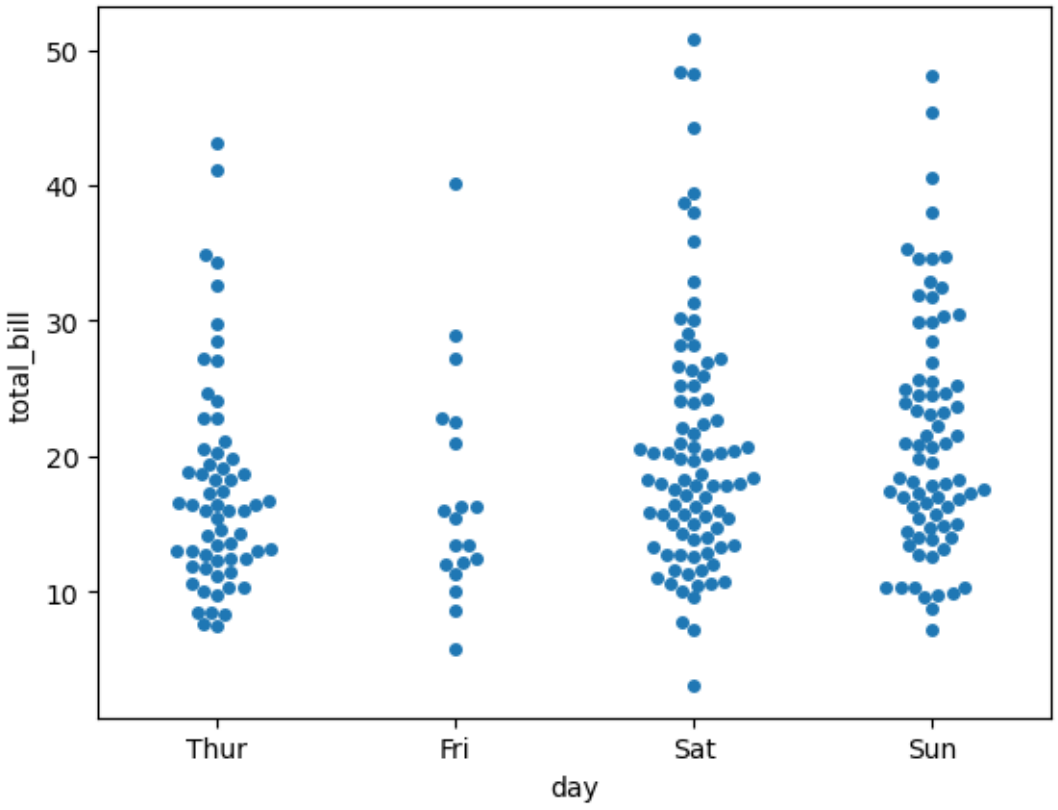
[31]:
```
sns.
↪boxplot(x='total_bill',y='day',data=tips,palette='rainbow',hue='smoker',orient='h')
```

[31]: <Axes: xlabel='total_bill', ylabel='day'>



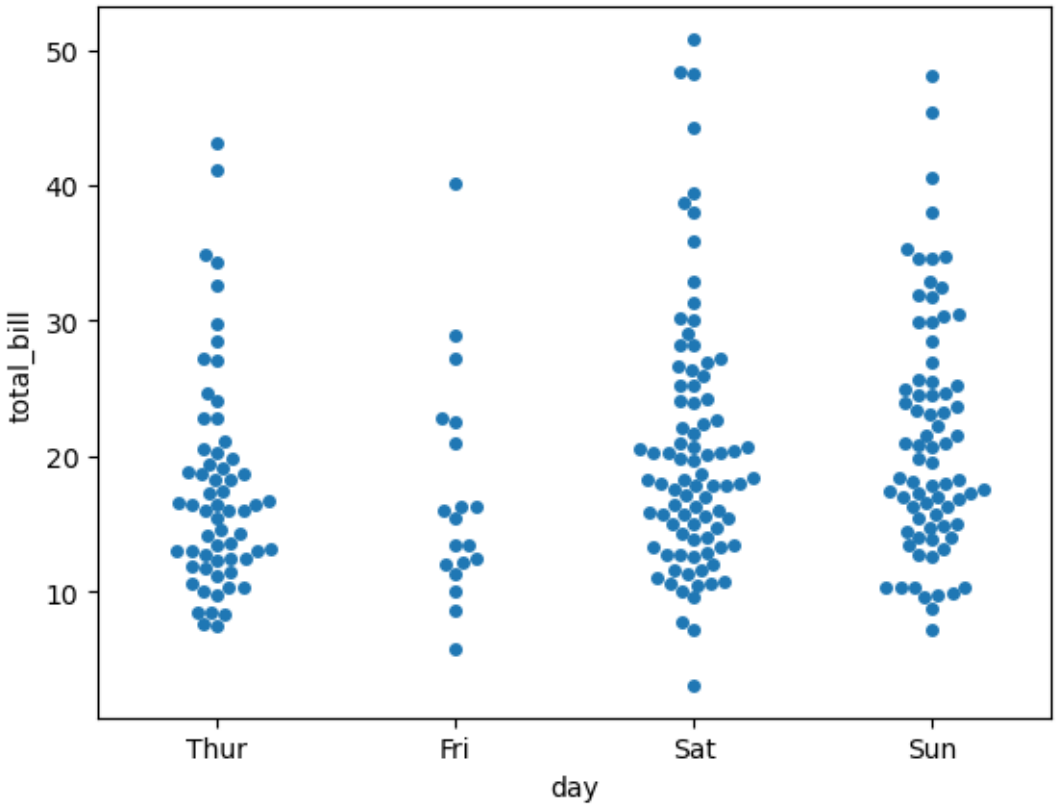
[32]:
```
sns.swarmplot(x='day',y='total_bill',data=tips)
```

[32]:
```
<Axes: xlabel='day', ylabel='total_bill'>
```



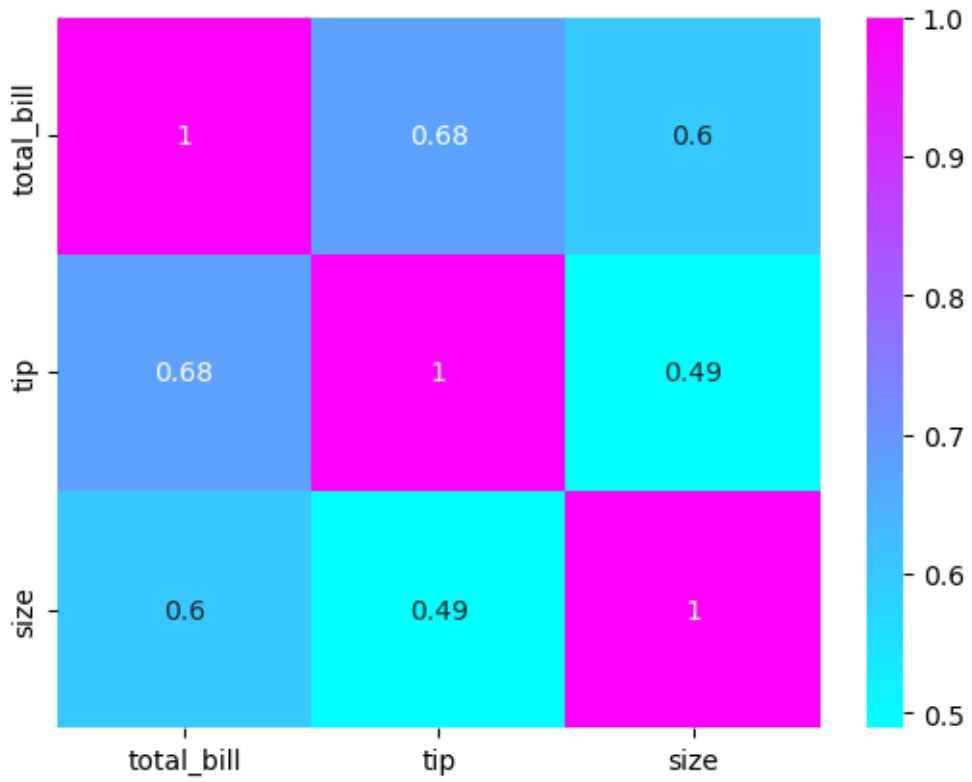
[33]:
```
sns.swarmplot(x='day',y='total_bill',data=tips,dodge=True)
```

[33]:
```
<Axes: xlabel='day', ylabel='total_bill'>
```



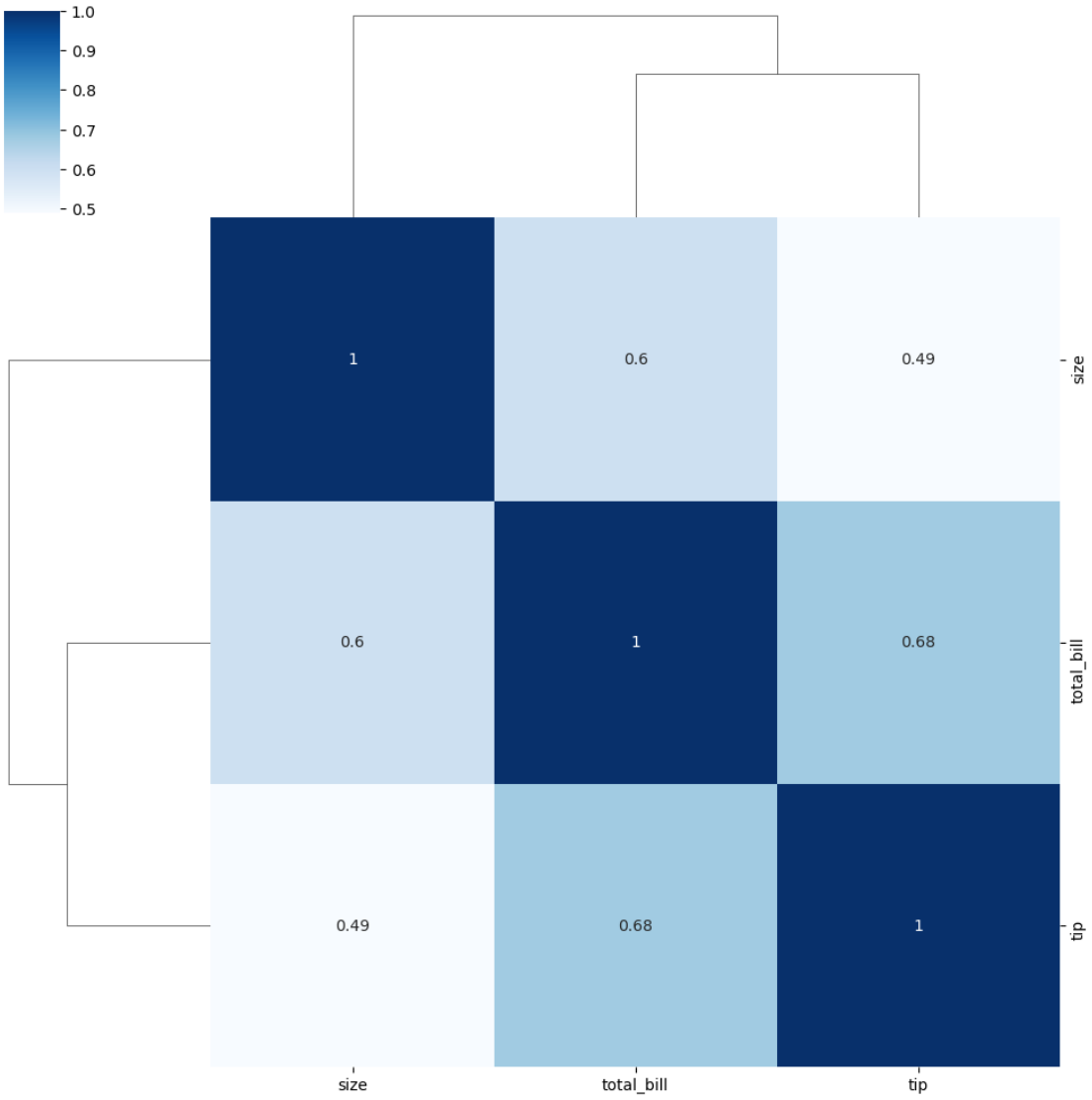
[34]:
```
sns.heatmap(tips.corr(numeric_only=True),annot=True,cmap='cool')
```

[34]: <Axes: >



[35]:
```
sns.clustermap(tips.corr(numeric_only=True),annot=True,cmap="Blues")
```

[35]:
```
<seaborn.matrix.ClusterGrid at 0x249e887c790>
```


1.0
0.9
0.8
0.7
0.6
0.5
1
0.6
0.49
0.6
1
0.68
0.49
0.68
1
size
total_bill
tip
size
total_bill
tip

[ ]: