In [1]: `import seaborn as sns`

In [3]: `%matplotlib inline`

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

In [5]: `tips.head()`

Out[5]:

|	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

In [11]: `sns.distplot(tips['total_bill']) ###HISTIGRAM`

```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
   warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

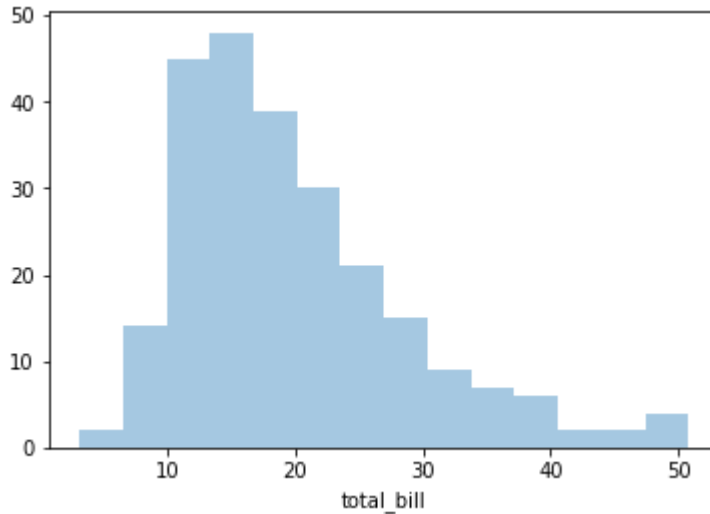Out[11]: `<matplotlib.axes._subplots.AxesSubplot at 0x85334a8>`
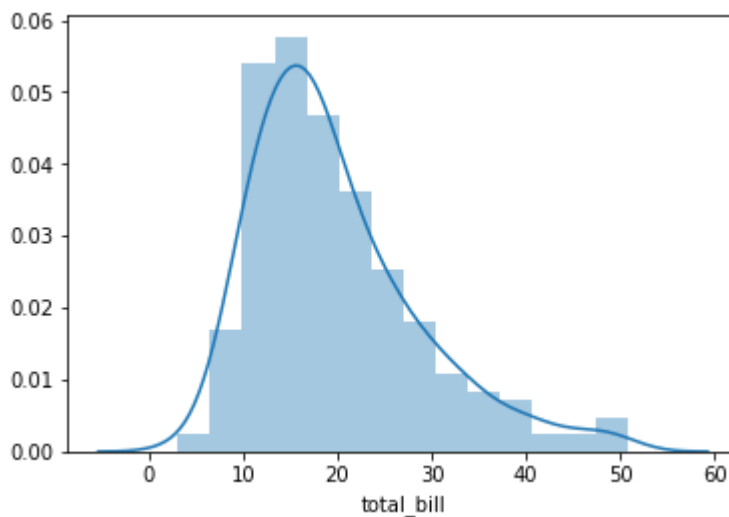
In [12]: `sns.distplot(tips['total_bill'],kde =False)`

```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
   warnings.warn("The 'normed' kwarg is deprecated, and has been "
```
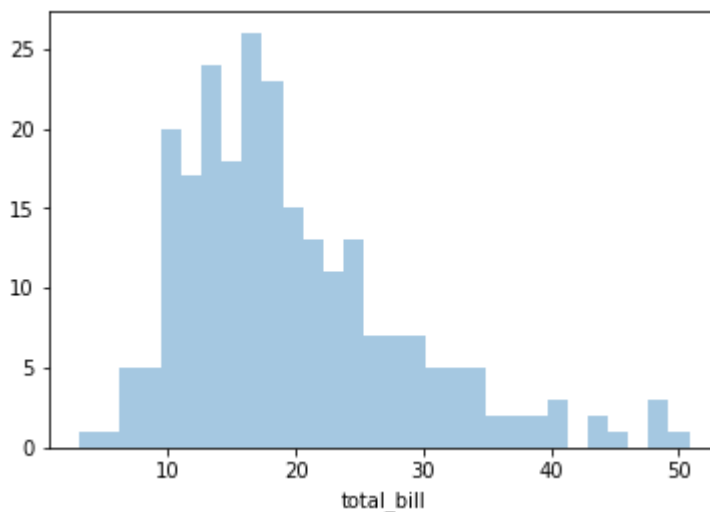
Out[12]: `<matplotlib.axes._subplots.AxesSubplot at 0x51e0860>`

In [13]: `sns.distplot(tips['total_bill'],kde =False,bins =30)`

```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
   warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

Out[13]: `<matplotlib.axes._subplots.AxesSubplot at 0x52ce438>`

In [14]: `# joint plot`

In [15]: `sns.jointplot(x='total_bill',y='tip',data=tips)`
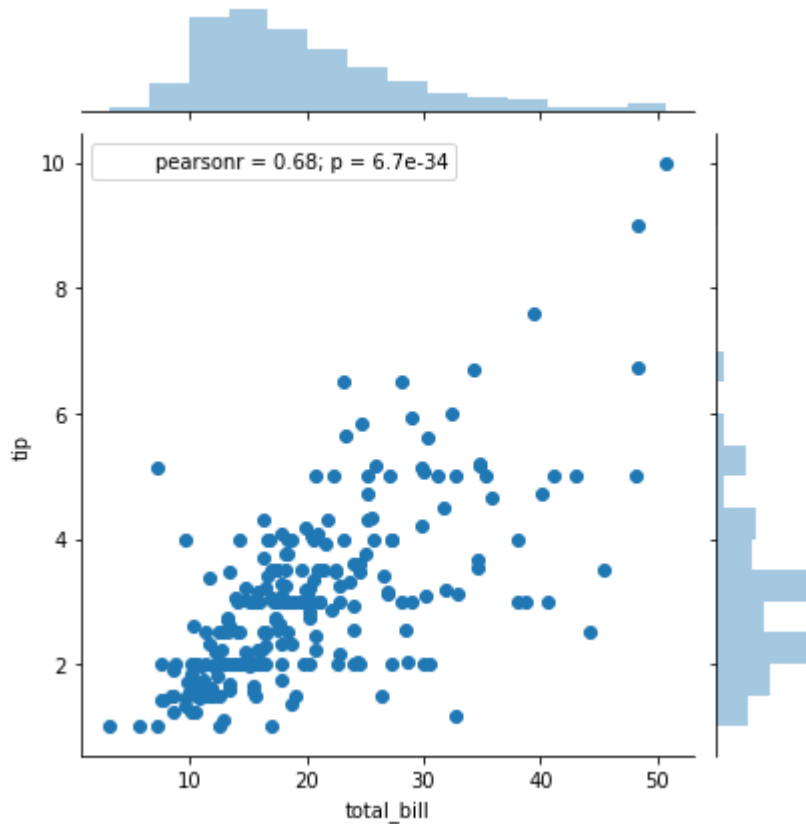
```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

Out[15]: `<seaborn.axisgrid.JointGrid at 0x53148d0>`

In [17]:
```
sns.jointplot(x='total_bill',y='tip',data=tips,kind ='hex')
```
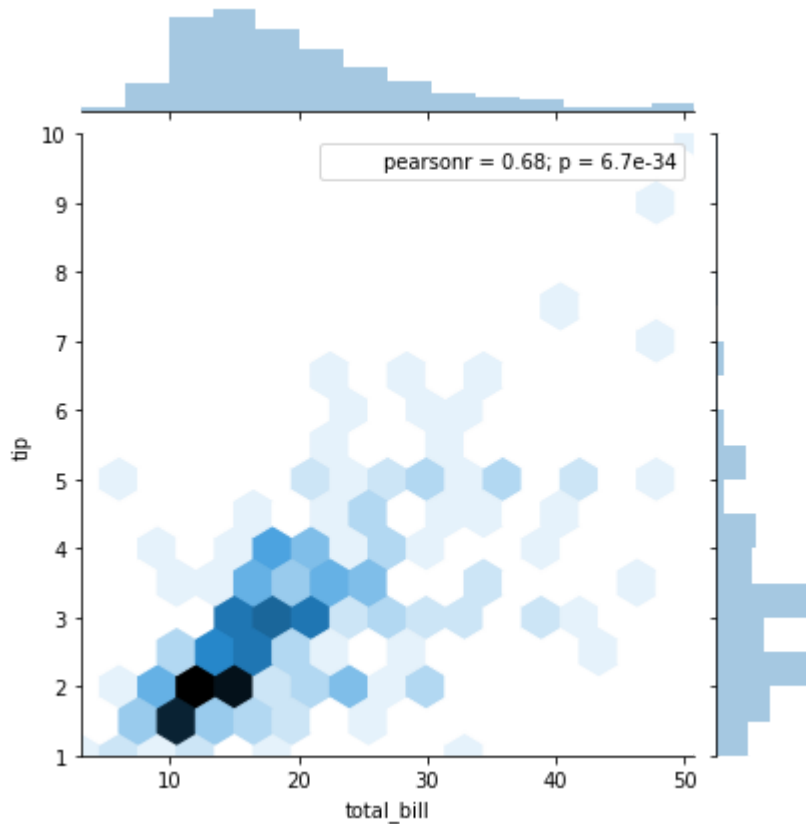
```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

Out[17]: <seaborn.axisgrid.JointGrid at 0xb955898>

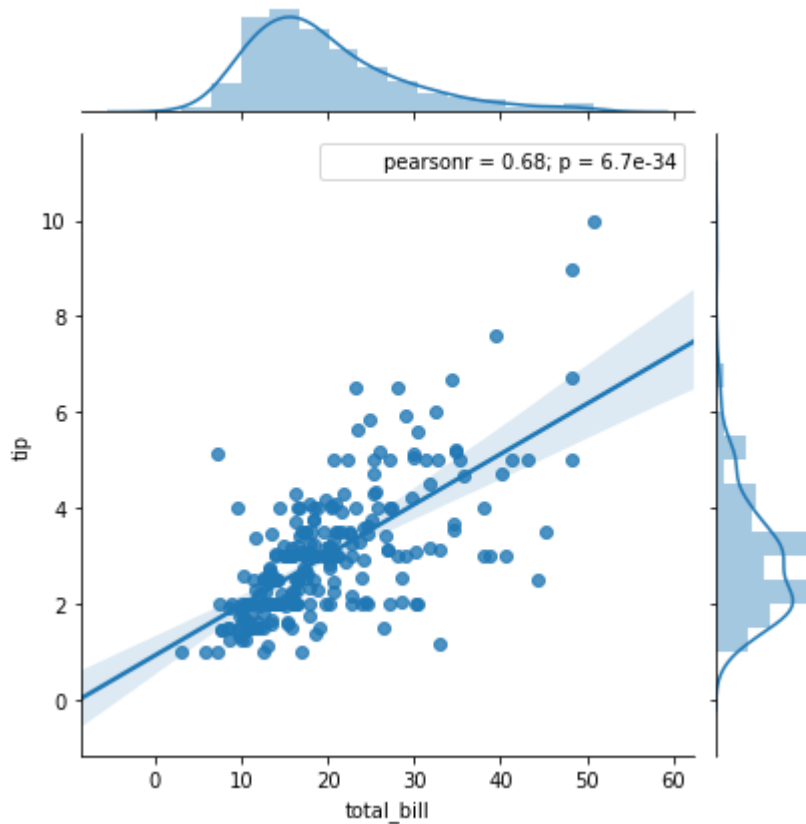In [19]: `sns.jointplot(x='total_bill',y='tip',data=tips,kind ='reg')`

```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
```
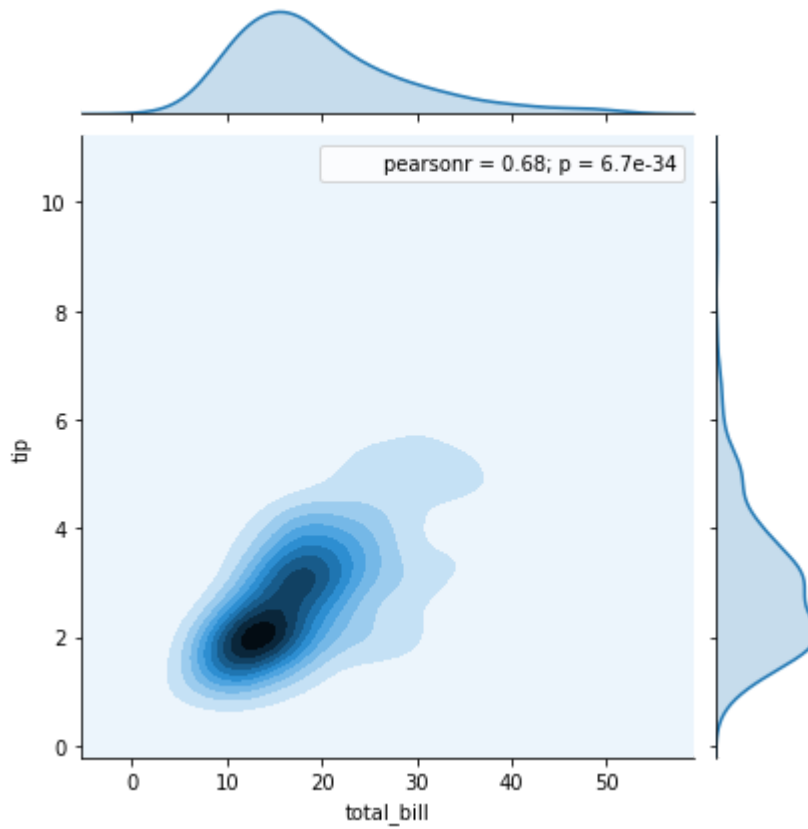
Out[19]: `<seaborn.axisgrid.JointGrid at 0xbf48710>`

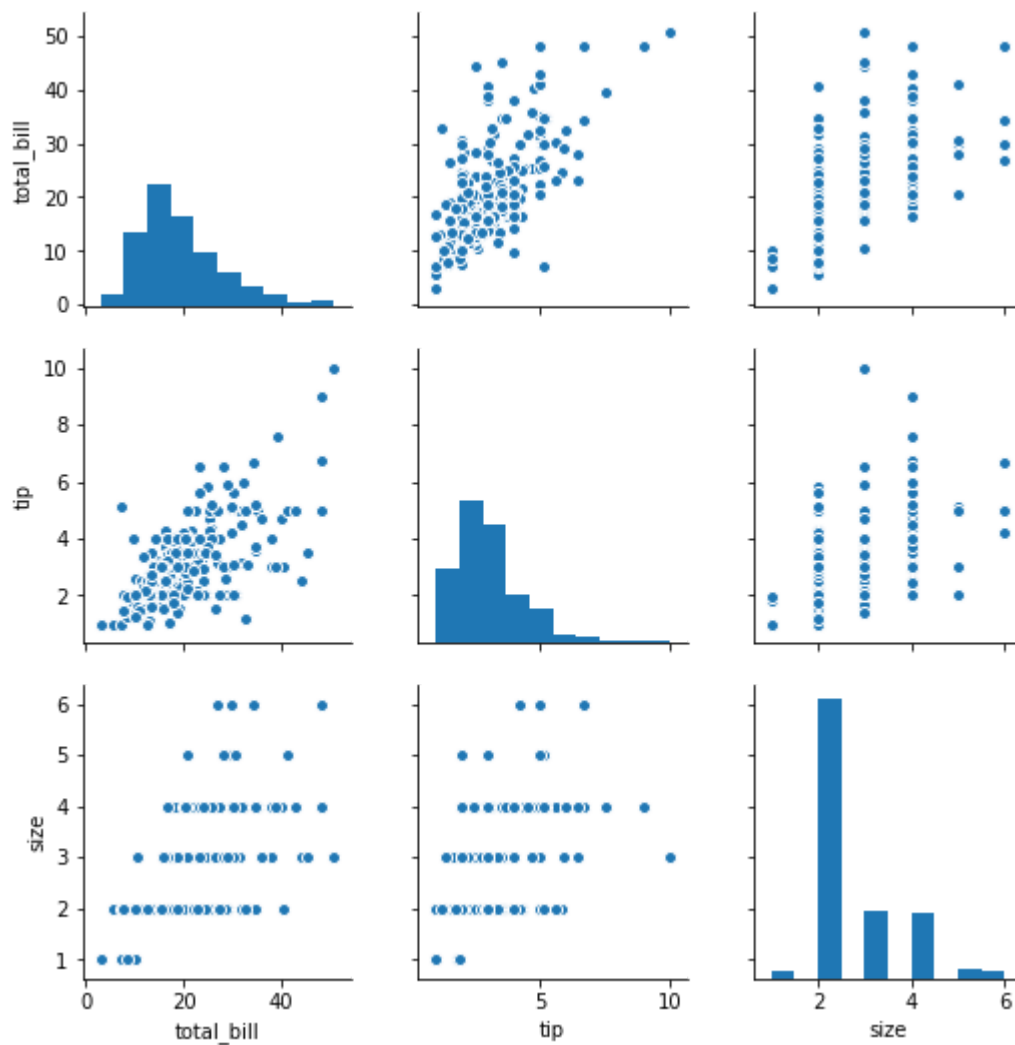In [20]: `sns.jointplot(x='total_bill',y='tip',data=tips,kind ='kde')`

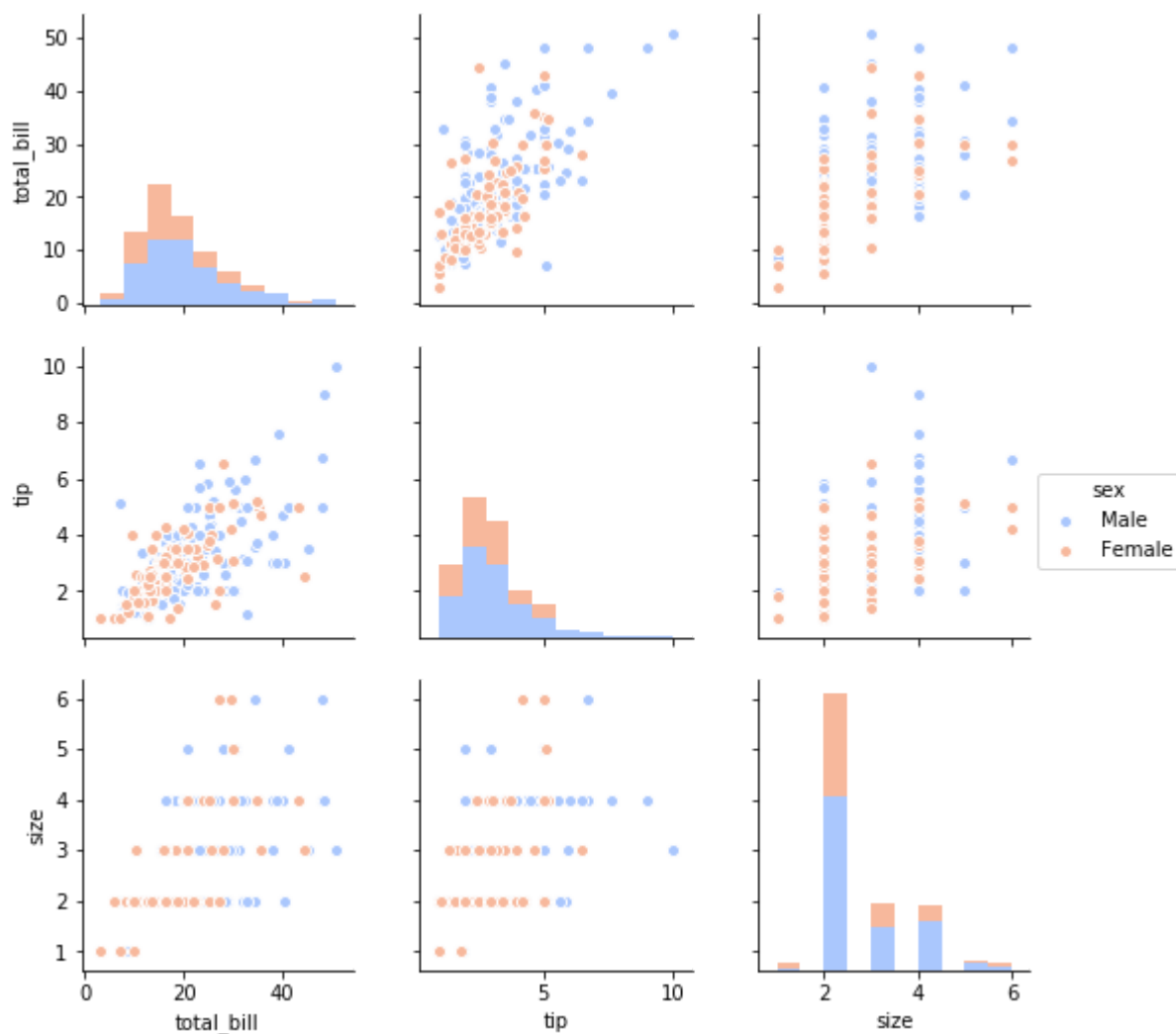Out[20]: `<seaborn.axisgrid.JointGrid at 0xc0a44a8>`

In [21]: `#PAIR PLOT`

In [22]: `sns.pairplot(tips)`

Out[22]: `<seaborn.axisgrid.PairGrid at 0xc1e3e48>`

In [24]: `sns.pairplot(tips,hue = 'sex',palette='coolwarm')`

Out[24]: `<seaborn.axisgrid.PairGrid at 0xe255ba8>`
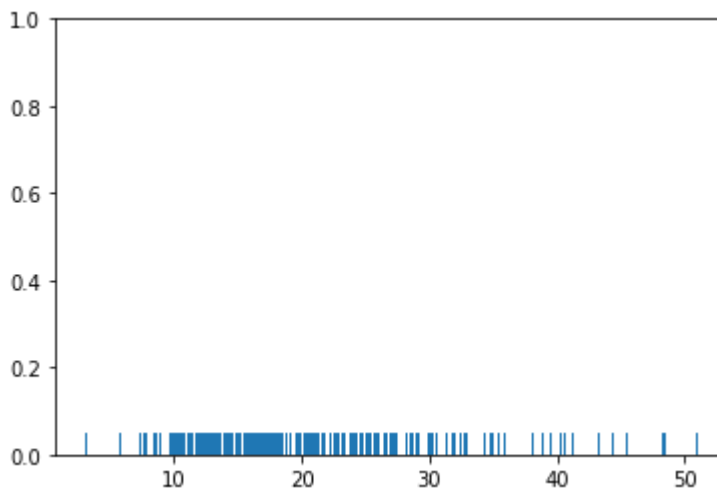

In [25]: `#RUGP PLOTS FOR KDE`

In [26]: `sns.rugplot(tips['total_bill'])`

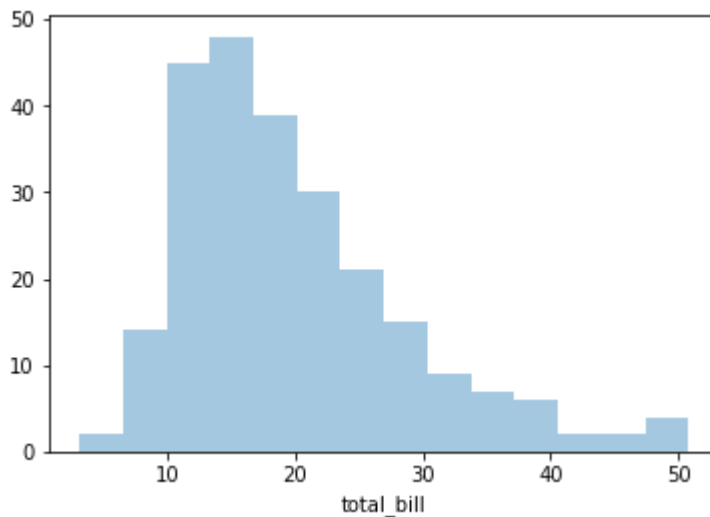Out[26]: `<matplotlib.axes._subplots.AxesSubplot at 0xe77c080>`

In [27]: `sns.distplot(tips['total_bill'],kde =False)`

```
C:\Users\q21\Anaconda3\lib\site-packages\matplotlib\axes\_axes.py:6462: UserWar
ning: The 'normed' kwarg is deprecated, and has been replaced by the 'density'
kwarg.
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

Out[27]: `<matplotlib.axes._subplots.AxesSubplot at 0xe6f5e10>`

In [28]: `#RUG PLOT WITH KDE`

In [29]: `#KDE Kernel Density Estimation Plots`

```
In [30]:  import numpy as np
          import matplotlib.pyplot as plt
          from scipy import stats

          #Create dataset
          dataset = np.random.randn(25)

          # Create another rugplot
          sns.rugplot(dataset);

          # Set up the x-axis for the plot
          x_min = dataset.min() - 2
          x_max = dataset.max() + 2

          # 100 equally spaced points from x_min to x_max
          x_axis = np.linspace(x_min,x_max,100)

          # Set up the bandwidth, for info on this:
          url = 'http://en.wikipedia.org/wiki/Kernel_density_estimation#Practical_estimatio

          bandwidth = ((4*dataset.std()**5)/(3*len(dataset)))**.2


          # Create an empty kernel list
          kernel_list = []

          # Plot each basis function
          for data_point in dataset:

              # Create a kernel for each point and append to list
              kernel = stats.norm(data_point,bandwidth).pdf(x_axis)
              kernel_list.append(kernel)

              #Scale for plotting
              kernel = kernel / kernel.max()
              kernel = kernel * .4
              plt.plot(x_axis,kernel,color = 'grey',alpha=0.5)

          plt.ylim(0,1)
```
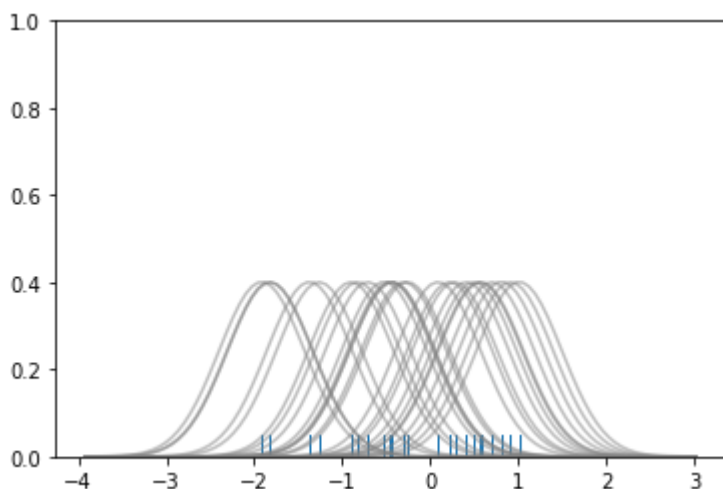
Out[30]: (0, 1)

In [31]:
```python
# To get the kde plot we can sum these basis functions.

# Plot the sum of the basis function
sum_of_kde = np.sum(kernel_list,axis=0)

# Plot figure
fig = plt.plot(x_axis,sum_of_kde,color='indianred')

# Add the initial rugplot
sns.rugplot(dataset,c = 'indianred')

# Get rid of y-tick marks
plt.yticks([])

# Set title
plt.suptitle("Sum of the Basis Functions")
```
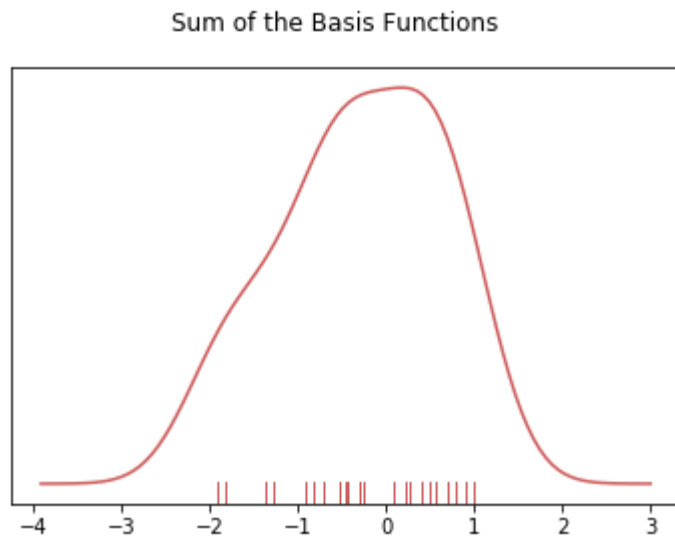
Out[31]: Text(0.5,0.98,'Sum of the Basis Functions')

Sum of the Basis Functions

In [ ]: