```python
In [15]:  import matplotlib.pyplot as plt
          import pandas as pd
          import numpy as np
```

```python
In [16]:  def kernel(point, xmat, k):
              m,n = np.shape(xmat)
              weights = np.mat(np.eye((m)))
              for j in range(m):
                  diff = point - X[j]
                  weights[j,j] = np.exp(diff*diff.T/(-2.0*k**2))
              return weights

          def localWeight(point, xmat, ymat, k):
              wei = kernel(point,xmat,k)
              W = (X.T*(wei*X)).I*(X.T*(wei*ymat.T))
              return W

          def localWeightRegression(xmat, ymat, k):
              m,n = np.shape(xmat)
              ypred = np.zeros(m)
              for i in range(m):
                  ypred[i] = xmat[i]*localWeight(xmat[i],xmat,ymat,k)
              return ypred
```
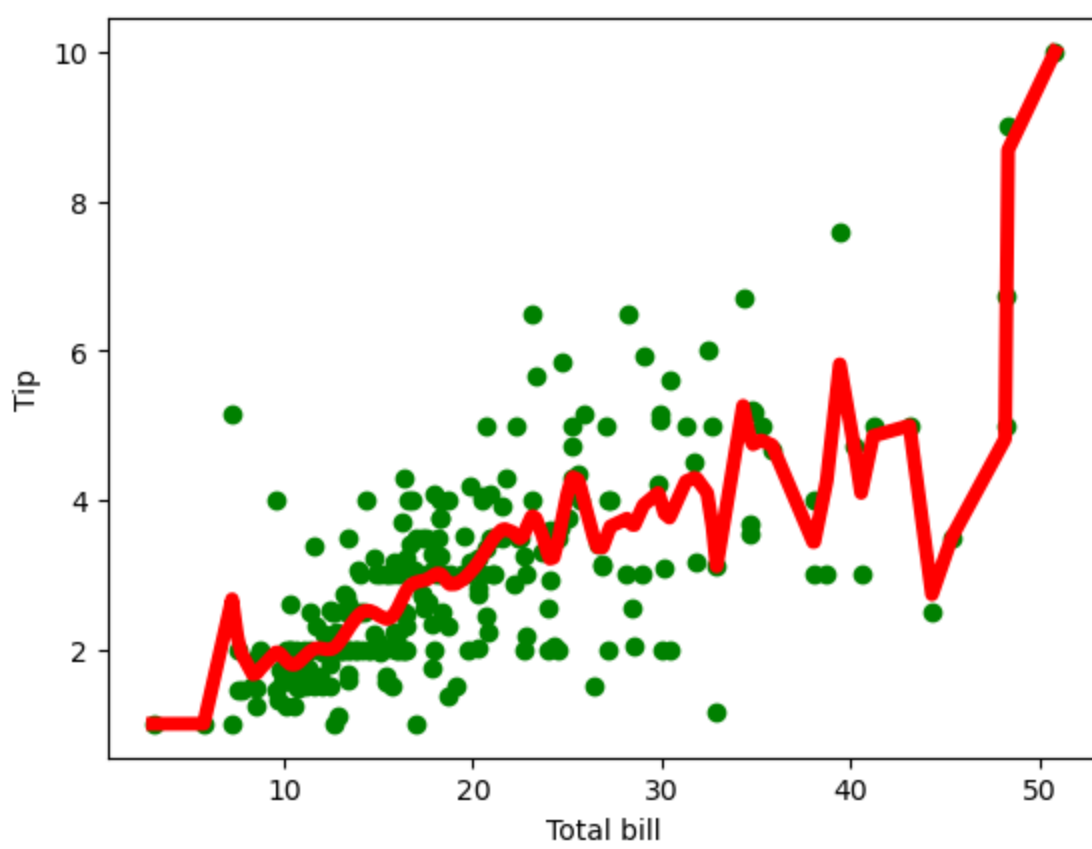
```python
In [17]:  # load data points
          data = pd.read_csv('restaurant_bill.csv')
          bill = np.array(data.total_bill)
          tip = np.array(data.tip)
```

```python
In [18]:  #preparing and add 1 in bill
          mbill = np.mat(bill)
          mtip = np.mat(tip)
```

```python
In [19]:  m= np.shape(mbill)[1]
          one = np.mat(np.ones(m))
          X = np.hstack((one.T,mbill.T))
```

```python
In [20]:  #set k here
          ypred = localWeightRegression(X,mtip,0.5)
          SortIndex = X[:,1].argsort(0)
          xsort = X[SortIndex][:,0]
```

```python
In [21]:  fig = plt.figure()
          ax = fig.add_subplot(1,1,1)
          ax.scatter(bill,tip, color='green')
          ax.plot(xsort[:,1],ypred[SortIndex], color = 'red', linewidth=5)
          plt.xlabel('Total bill')
          plt.ylabel('Tip')
          plt.show();
```

Loading [MathJax]/extensions/Safe.js

In [ ]: