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

```
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 localweigth(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]*localweigth(xmat[i],xmat,ymat,k)
  return ypred

def graphplot(X,ypred):
  sortindex=X[:,1].argsort(0)
  xsort=X[sortindex][:,0]
  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()

data=pd.read_csv('/content/10data_tips.csv')
bill=np.array(data.total_bill)
mbill=np.mat(bill)
tip=np.array(data.tip)
mtip=np.mat(tip)
m=np.shape(mbill)[1]
one=np.mat(np.ones(m))
X=np.hstack((one.T,mbill.T))
ypred=localweightregression(X,mtip,8)
graphplot(X,ypred)
```