In [2]:
```python
import numpy as np
import matplotlib.pyplot as plt
```

In [100]:
```python
def kernel(point,X,k):
    m = X.shape[0]
    wt = np.mat(np.eye(m))
    for j in range(m):
        diff = np.mat(point - X[j])
        wt[j,j] = np.exp(diff*diff.T/(-2.0*k**2))
    return wt
```
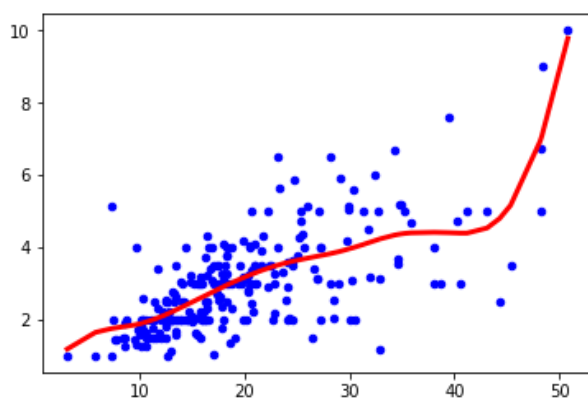
In [124]:
```python
def local_weight(point,X,y,k):
    wei = kernel(point,X,k)
    W = (X.T*(wei*X)).I*(X.T*(wei*y))
    return W
```

In [125]:
```python
def local_weight_regression(X,y,k):
    m = X.shape[0]
    ypred = np.zeros(m)
    for i in range(m):
        ypred[i] =  X[i] * local_weight(X[i],X,y,k)
    return ypred
```

In [129]:
```python
data = np.genfromtxt('tips.csv',delimiter=',',skip_header=1)
X = data[:,0]
ones = np.ones(X.shape[0])
X = np.column_stack((ones,X))
y = data[:,1].reshape(-1,1)
```

In [156]:
```python
k = 3
ypred = local_weight_regression(X,y,k)
idx = X[:,1].argsort(0) #sort by index
X_sorted = X[idx][:,1]
ypred_sorted = ypred[idx]
plt.scatter(X[:,1],y,color='b',s=20)
plt.plot(X_sorted,ypred_sorted,color='red',linewidth=3)
```

Out[156]: [<matplotlib.lines.Line2D at 0x7f4ede0dc160>]

In [ ]:
```python

```