In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [2]:
```
tou= 0.5 #tou is the bandwidth parameter and controls the rate at which w^{(i)} fall
```

In [3]:
```
#TRAINSET DATA
X_train = np.array(list(range(3, 33)) )
print(X_train)
X_train=X_train[:,np.newaxis]
print(X_train)
y_train = np.array([1,2,1,2,1,1,3,4,5,4,5,6,5,6,7,8,9,10,11,11,12,11,11,10,12,11,11,10,
print(y_train)
#the newaxis is used to increase the dimension of the existing array by one more dimens
#1D array will become 2D array
#2D array will become 3D array
```

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 12 11 11 10  9  8]
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In [4]:
```
X_train.shape
```

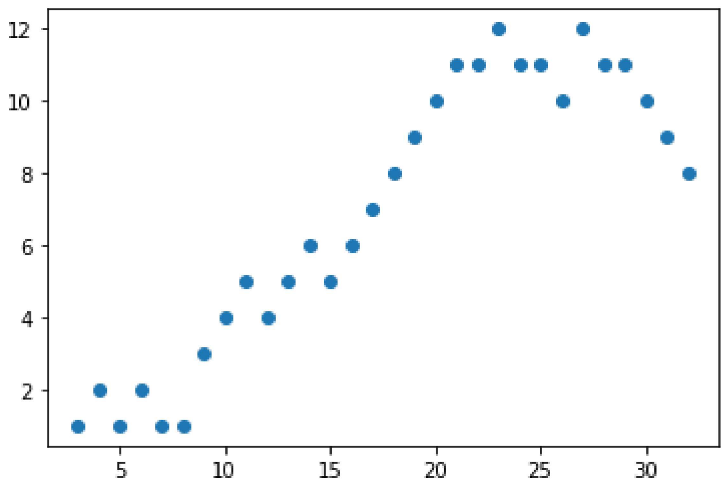
Out[4]: (30, 1)

In [5]:
```
y_train.shape
```

Out[5]: (30,)

In [12]:
```
plt.scatter(X_train,y_train)
```

Out[12]: <matplotlib.collections.PathCollection at 0x1fed90809a0>



In [7]:
```
X_test = np.array([i/10. for i in range(400)])
print(X_test)
X_test=X_test[:,np.newaxis]
print(X_test)
y_test=[]
print(y_test)
```

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  4.2  4.3  4.4  4.5  4.6  4.7  4.8  4.9  5.   5.1  5.2  5.3  5.4  5.5
  5.6  5.7  5.8  5.9  6.   6.1  6.2  6.3  6.4  6.5  6.6  6.7  6.8  6.9
  7.   7.1  7.2  7.3  7.4  7.5  7.6  7.7  7.8  7.9  8.   8.1  8.2  8.3
  8.4  8.5  8.6  8.7  8.8  8.9  9.   9.1  9.2  9.3  9.4  9.5  9.6  9.7
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```

In [8]:

```
X_test.shape
```

Out[8]:

```
(400, 1)
```

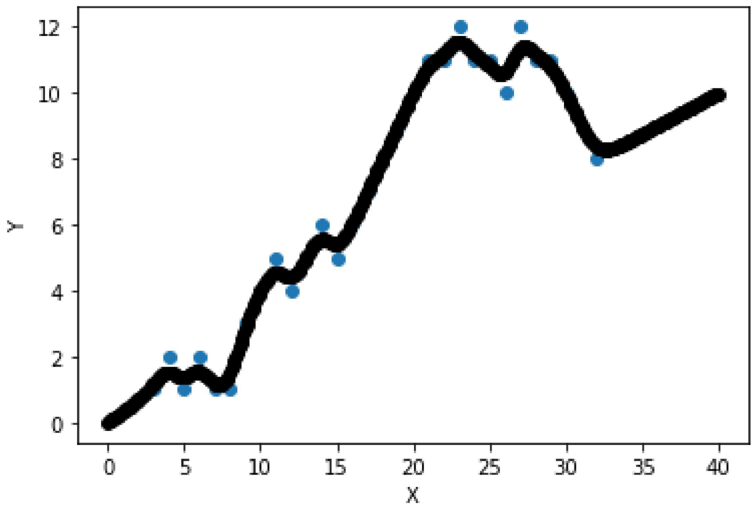
In [9]:

```
for r in range(len(X_test)):
    wts=np.exp(-np.sum((X_train-X_test[r])**2,axis=1)/(2*tou)**2)
    W=np.diag(wts)
    #constant value
    factor1 = np.linalg.inv(X_train.T.dot(W).dot(X_train)) # find inverse of (X.T*W*X)
    parameters=factor1.dot(X_train.T).dot(W).dot(y_train) # final values of beta
```

```
    prediction=X_test[r].dot(parameters)
    y_test.append(prediction)
```

In [13]:

```
y_test = np.array(y_test)
plt.scatter(X_train, y_train)
plt.scatter(X_test, y_test, color='black')
plt.xlabel('X')
plt.ylabel('Y')
plt.show()
```



In [ ]:

In [ ]: