

In [1]:

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
import matplotlib.pyplot as plt
tou = 0.8
X_train = np.array(list(range(3,33))+[3.2,4.2])
X_train

import warnings
warnings.filterwarnings('ignore')
```

In [2]:

```
# Increase the dimensionality useful while plotting graphs
X_train = X_train[:,np.newaxis]
X_train
```

Out[2]:

```
array([[ 3. ],
       [ 4. ],
       [ 5. ],
       [ 6. ],
       [ 7. ],
       [ 8. ],
       [ 9. ],
       [10. ],
       [11. ],
       [12. ],
       [13. ],
       [14. ],
       [15. ],
       [16. ],
       [17. ],
       [18. ],
       [19. ],
       [20. ],
       [21. ],
       [22. ],
       [23. ],
       [24. ],
       [25. ],
       [26. ],
       [27. ],
       [28. ],
       [29. ],
       [30. ],
       [31. ],
       [32. ],
       [ 3.2],
       [ 4.2]])
```

In [3]:

```
len(X_train)
```

Out[3]:

32

In [4]:

```
y_train = np.array([1,2,1,2,1,1,3,4,5,4,5,6,5,6,7,8,9,10,11,11,12,11,11,12,13,16,17,19,18,3
print(len(y_train))
X_test=np.array([i/10. for i in range(400)])
X_test=X_test[:,np.newaxis]
y_test=[]
X_test
```

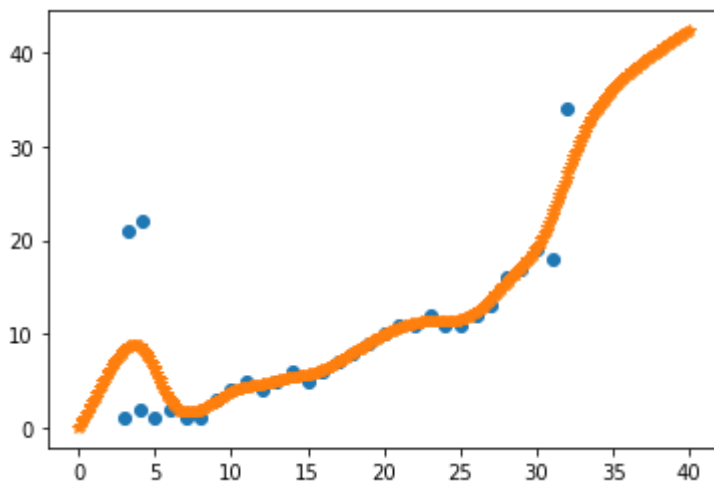
32

In [5]:

```

count = 0
for r in range(len(X_test)):
    try:
        wt = np.exp(-np.sum((X_train-X_test[r])**2,axis=1)/(2*tou)**2)
        w = np.diag(wt)
        fact1 = np.linalg.inv(X_train.T.dot(w).dot(X_train))
        parameter=fact1.dot(X_train.T).dot(w).dot(y_train)
        prediction=X_test[r].dot(parameter)
        y_test.append(prediction)
        count+=1
    except:
        pass
y_test=np.array(y_test)
plt.plot(X_train.squeeze(), y_train,'o')
plt.plot(X_test.squeeze(), y_test,'*')
plt.show()
y_test

```



Out[5]:

```

array([ 0.          ,  0.2845969 ,  0.5725125 ,  0.86357667,  1.15759705,
        1.45435693,  1.75361314,  2.05509367,  2.35849523,  2.66348064,
        2.96967608,  3.27666827,  3.58400147,  3.89117446,  4.19763739,
        4.50278866,  4.80597175,  5.1064721 ,  5.40351407,  5.69625809,
        5.98379794,  6.26515846,  6.53929352,  6.80508468,  7.06134041,
        7.30679619,  7.5401158 ,  7.75989381,  7.96465983,  8.15288483,
        8.32298982,  8.47335765,  8.60234831,  8.70831828,  8.7896448 ,
        8.84475529,  8.87216269,  8.87050684,  8.83860199,  8.77548995,
        8.68049796,  8.55329942,  8.39397525,  8.2030721 ,  7.98165348,
        7.73133878,  7.45432483,  7.15338518,  6.83184248,  6.49351164,
        6.14261286,  5.7836571 ,  5.42130916,  5.06023635,  4.70495293,
        4.35967157,  4.02817259,  3.71370031,  3.41889307,  3.14574977,
        2.89563261,  2.66930206,  2.46697776,  2.28841767,  2.13300725,
        1.99985095,  1.88785951,  1.7958282 ,  1.7225026 ,  1.6666305 ,
        1.62699956,  1.60246164,  1.59194543,  1.59445951,  1.60908793,
        1.63498081,  1.6713418 ,  1.71741546,  1.77246825,  1.83578738,
        1.90665981,  1.98437037,  2.06819598,  2.15740378,  2.2512516 ,
        2.34899063,  2.44986966,  2.55314046,  2.65806384,  2.76391594,
        2.86999446,  2.97562446,  3.08016368,  3.18300724,  3.28359179,
        3.38139922,  3.47595991,  3.56685591,  3.65372395,  3.73625858,
        3.81421524,  3.88741354,  3.95574031,  4.01915247,  4.07767931,
        4.13142399,  4.18056381,  4.22534896,  4.26609955,  4.3032005 ,
        4.33709436,  4.36827188,  4.3972606 ,  4.42461152,  4.4508844 ,
        4.47663211,  4.50238453,  4.52863275,  4.55581426,  4.58429957,

```

```
4.61548113, 4.6462649 , 4.68006501, 4.71580187, 4.75340375,
4.79271197, 4.83348935, 4.87543173, 4.91818219, 4.96134716,
5.00451411, 5.04726992, 5.08921917, 5.13000188, 5.16930963,
5.20689976, 5.24260685, 5.27635113, 5.3081545 , 5.33808691,
5.3663742 , 5.39328233, 5.41916351, 5.4444335 , 5.46955768,
5.49503549, 5.52138402, 5.54912132, 5.57875028, 5.61074374,
5.64553117, 5.68348778, 5.724926 , 5.77008979, 5.81915169,
5.87221264, 5.92930422, 5.99039311, 6.05538733, 6.12415485,
6.19647713, 6.27216804, 6.35097292, 6.43263226, 6.51687874,
6.60344443, 6.69206697, 6.78249463, 6.87449018, 6.96783378,
7.06232466, 7.15778205, 7.25404515, 7.35097259, 7.44844118,
7.54634448, 7.64459086, 7.74310154, 7.84180845, 7.9406521 ,
8.03957935, 8.13854139, 8.23749164, 8.3363838 , 8.43516998,
8.53379897, 8.63221457, 8.73035412, 8.82814723, 8.92551466,
9.0223675 , 9.11860665, 9.21412269, 9.30879609, 9.40249789,
9.49509092, 9.58643141, 9.67637111, 9.76475982, 9.85144831,
9.93629139, 10.01915119, 10.09990028, 10.17842457, 10.2546258 ,
10.32842337, 10.39975534, 10.46857857, 10.5348678 , 10.59861367,
10.65981985, 10.71849918, 10.77466929, 10.82834777, 10.87954726,
10.92827095, 10.9745087 , 11.01823424, 11.05940376, 11.09795612,
11.13381486, 11.16689204, 11.19709386, 11.22432784, 11.24851126,
11.26958043, 11.2875003 , 11.30227392, 11.31395114, 11.32263601,
11.3284926 , 11.33174854, 11.33269639, 11.33169248, 11.32915322,
11.32554924, 11.32139739, 11.3172511 , 11.31368956, 11.31130618,
11.31069688, 11.31244868, 11.31712913, 11.32527699, 11.33739435,
11.35394061, 11.3753283 , 11.40192087, 11.4340322 , 11.47192784,
11.51582759, 11.56590914, 11.6223124 , 11.68514412, 11.75448239,
11.83038069, 11.91287113, 12.0019666 , 12.09766172, 12.19993244,
12.30873428, 12.4239995 , 12.54563319, 12.67350878, 12.80746329,
12.94729272, 13.09274818, 13.24353296, 13.39930117, 13.55965817,
13.72416302, 13.8923331 , 14.06365079, 14.23757231, 14.41353818,
14.59098523, 14.7693596 , 14.94813048, 15.12680395, 15.30493685,
15.48215014, 15.65814157, 15.83269766, 16.00570466, 16.17715868,
16.34717481, 16.51599522, 16.68399608, 16.85169302, 17.01974472,
17.18895407, 17.36026621, 17.53476257, 17.7136503 , 17.89824607,
18.08995395, 18.29023704, 18.50058292, 18.72246382, 18.95729245,
19.2063753 , 19.47086554, 19.75171785, 20.04964773, 20.36509769,
20.69821235, 21.0488241 , 21.41645016, 21.80030121, 22.19930111,
22.61211636, 23.03719359, 23.47280289, 23.91708469, 24.36809778,
24.82386637, 25.28242426, 25.74185474, 26.20032504, 26.65611476,
27.10763799, 27.55345932, 27.99230392, 28.4230624 , 28.84479103,
29.25670813, 29.65818734, 30.04874857, 30.42804712, 30.79586189,
31.15208282, 31.49669832, 31.82978277, 32.15148456, 32.46201472,
32.76163636, 33.05065497, 33.32940963, 33.59826509, 33.85760485,
34.10782501, 34.34932894, 34.58252278, 34.80781157, 35.02559602,
35.23626984, 35.44021762, 35.63781308, 35.82941777, 36.01538009,
36.19603454, 36.37170134, 36.54268614, 36.70927994, 36.87175921,
37.03038605, 37.18540849, 37.33706083, 37.48556412, 37.63112655,
37.77394402, 37.91420059, 38.05206907, 38.18771152, 38.3212798 ,
38.45291608, 38.58275338, 38.71091606, 38.83752032, 38.96267468,
39.08648042, 39.20903201, 39.33041756, 39.45071918, 39.57001338,
39.68837154, 39.80585968, 39.92253989, 40.03846954, 40.1537021 ,
40.26828731, 40.3822714 , 40.49569739, 40.60860524, 40.7210321 ,
40.83301249, 40.94457847, 41.05575985, 41.16658429, 41.27707751,
41.38726336, 41.49716402, 41.60680005, 41.71619057, 41.82535331,
41.93430472, 42.0430601 , 42.15163361, 42.26003843, 42.36828676])
```

In [ ]:

