In [1]:
```
#import statements
import pandas as pd
import numpy as np
from numpy import linalg as la
from sklearn import decomposition
from sklearn.decomposition import PCA
from sklearn.neighbors import KNeighborsRegressor
from sklearn.preprocessing import StandardScaler
from matplotlib import *
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error
```

In [2]:
```
#raw_data
df = pd.read_csv("kc_house_data.csv")
df.head(3)
```

Out[2]:

	id	date	price	bedrooms	bathrooms	sqft_living	sqft_lot	f
0	7129300520	20141013T000000	221900.0	3	1.00	1180	5650	
1	6414100192	20141209T000000	538000.0	3	2.25	2570	7242	2
2	5631500400	20150225T000000	180000.0	2	1.00	770	10000	

3 rows × 21 columns

In [3]:
```
#pre-processing and cleaning
#drop id and zipcode
df=df.drop(['id','date','zipcode','yr_renovated','view','waterfront'],1)
df.head(3)
```

Out[3]:

	price	bedrooms	bathrooms	sqft_living	sqft_lot	floors	condition	grade	sqft_ab
0	221900.0	3	1.00	1180	5650	1.0	3	7	1180
1	538000.0	3	2.25	2570	7242	2.0	3	7	2170
2	180000.0	2	1.00	770	10000	1.0	3	6	770

In [4]:
```
df.shape
```

Out[4]: (21613, 15)

In [5]:
```
X=df.drop(['price'],1)
```

In [6]:
```
Y=df[['price']]
```

In [7]:
```
Xs=(X-X.mean())/(X.std())
```

In [8]:
```
Xs.head(3)
```

Out[8]:

	bedrooms	bathrooms	sqft_living	sqft_lot	floors	condition	grade	sqft_ab
0	-0.398728	-1.447430	-0.979812	-0.228316	-0.915406	-0.629172	-0.558823	-0.7346
1	-0.398728	0.175603	0.533622	-0.189881	0.936484	-0.629172	-0.558823	0.4608
2	-1.473925	-1.447430	-1.426221	-0.123296	-0.915406	-0.629172	-1.409554	-1.2298

In [9]:
```
X_train, X_test, Y_train, Y_test = train_test_split(Xs, Y, test_size=0.2, rand
om_state=0)
```

In [10]:
```
accuracy_values=[]
mse=[]
neighbor_count=[3,5,10,12,15,20,25,30,35,40,45,50]
Ytest=Y_test.values
```

In [11]:
```
for i in neighbor_count:
    neigh = KNeighborsRegressor(n_neighbors = i, metric = 'euclidean')
    neigh.fit(X_train,Y_train)
    PRED=neigh.predict(X_test)
    Error=PRED-Ytest
    ten_score=neigh.score(X_test,Y_test)
    accuracy_values.append(ten_score)
    mse.append(mean_squared_error(Ytest,PRED))
```

In [12]:
```
print(Ytest)
```

```
[[ 297000.]
 [1578000.]
 [ 562100.]
 ...
 [ 369950.]
 [ 300000.]
 [ 575950.]]
```

In [13]:
```
print(PRED)
```

```
[[ 386111.66]
 [1609968.  ]
 [ 532385.  ]
 ...
 [ 432264.44]
 [ 258812.  ]
 [ 455947.  ]]
```

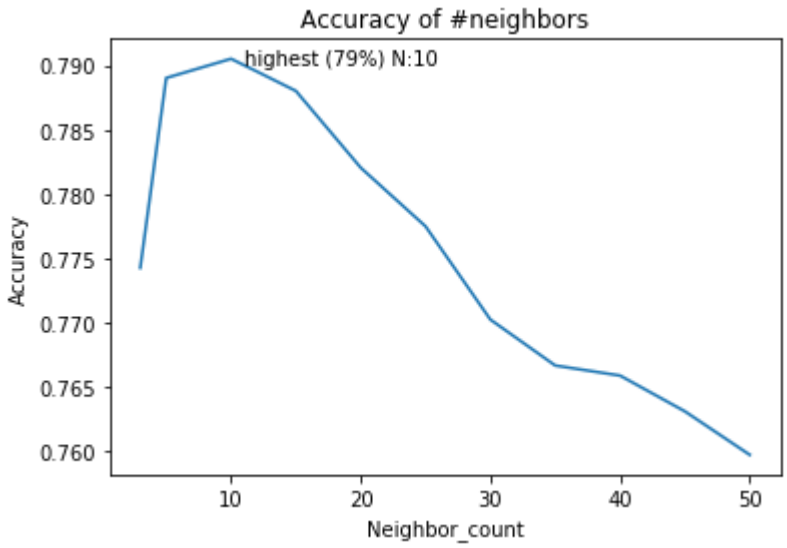
In [14]:
```
print accuracy_values
```

```
[0.7742561338257761, 0.7890281664615836, 0.7905213129736296, 0.78952972077425
64, 0.7880218579299059, 0.7820522968732835, 0.777488214455668, 0.770238428860
2513, 0.7666632496388464, 0.7658808307814662, 0.7630979101740246, 0.759716443
0260059]
```

In [15]:
```
print mse
```

```
[26846424332.970028, 25089671145.73037, 24912099787.83246, 25030024165.58316
4, 25209345652.547123, 25919271339.227676, 26462051505.75228, 27324226960.244
58, 27749402536.754715, 27842451127.65258, 28173407927.40315, 28575546437.131
897]
```

In [16]:
```
plt.plot(neighbor_count,accuracy_values)
plt.xlabel('Neighbor_count')
plt.ylabel('Accuracy')
plt.title('Accuracy of #neighbors')
plt.text(11,0.79, r'highest (79%) N:10')
plt.show()
```



In [17]:
```
#training the final model
neigh = KNeighborsRegressor(n_neighbors = 10, metric = 'euclidean')
neigh.fit(X,Y)
```

Out[17]:
```
KNeighborsRegressor(algorithm='auto', leaf_size=30, metric='euclidean',
          metric_params=None, n_jobs=1, n_neighbors=10, p=2,
          weights='uniform')
```

In [18]:
```
plt.scatter(Ytest, PRED)
plt.xlabel('True Values')
plt.ylabel('Predictions')
plt.axis('equal')
plt.xlim(plt.xlim())
plt.ylim(plt.ylim())
_ = plt.plot(Ytest,Ytest)
```