K nearest neighbour

In [23]:

```
#Importing libraries
%matplotlib inline
import numpy as np
import pandas as pd
import datetime as dt
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

In [10]:

```
# Reading files
df = pd.read_csv('nyc_taxi_trip_duration.csv')
df['pickup_datetime'] = pd.to_datetime(df.pickup_datetime)
df['dropoff_datetime'] = pd.to_datetime(df.dropoff_datetime)
df.shape
#removing outliers
df=df[df["trip_duration"]<6000]
df = df.loc[(df.pickup_latitude > 40.6) & (df.pickup_latitude < 40.9)]
df = df.loc[(df.dropoff_latitude>40.6) & (df.dropoff_latitude < 40.9)]
df = df.loc[(df.dropoff_longitude > -74.05) & (df.dropoff_longitude < -73.7)]
df = df.loc[(df.pickup_longitude > -74.05) & (df.pickup_longitude < -73.7)]
df.drop(["id","pickup_datetime","dropoff_datetime", "store_and_fwd_flag"],axis=1,inplace=True)
```

In [7]:

```
df.dtypes
```

Out[7]:

```
vendor_id              int64
passenger_count        int64
pickup_longitude     float64
pickup_latitude      float64
dropoff_longitude    float64
dropoff_latitude     float64
trip_duration          int64
dtype: object
```

In [17]:

```
df.head()
```

Out[17]:

	vendor_id	passenger_count	pickup_longitude	pickup_latitude	dropoff_longitude	dropoff_latitude	trip_duration
0	2	1	-73.953918	40.778873	-73.963875	40.771164	400
1	1	2	-73.988312	40.731743	-73.994751	40.694931	1100
2	2	2	-73.997314	40.721458	-73.948029	40.774918	1635
3	2	6	-73.961670	40.759720	-73.956779	40.780628	1141
4	1	1	-74.017120	40.708469	-73.988182	40.740631	848

In [11]:

```
#seperating independent and dependent variables
x = df.drop(['trip_duration'], axis=1)
y = df['trip_duration']
x.shape, y.shape
```

Out[11]:

```
((724984, 6), (724984,))
```

In [12]:

```
# Importing MinMax Scaler
from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler()
x_scaled = scaler.fit_transform(x)
```

In [13]:

```
x = pd.DataFrame(x_scaled)
```

In [14]:

```
# Importing Train test split
from sklearn.model_selection import train_test_split
train_x,test_x,train_y,test_y = train_test_split(x,y, random_state = 52)
```

In [30]:

```
#importing KNN regressor and metric mse

from sklearn.neighbors import KNeighborsRegressor as KNN
from sklearn.metrics import mean_squared_error as mse
from sklearn.metrics import mean_absolute_error as mae
```

In [8]:

```
# Creating instance of KNN
reg = KNN(n_neighbors = 45)

# Fitting the model
reg.fit(train_x, train_y)

# Predicting over the Train Set and calculating MSE
test_predict = reg.predict(test_x)
k = mse(test_predict, test_y)
print('Test MSE    ', k )
```

```
Test MSE     130171.16534178023
```

In [ ]:

```
#Defining K range
k = range(25,56)
```

In [ ]:

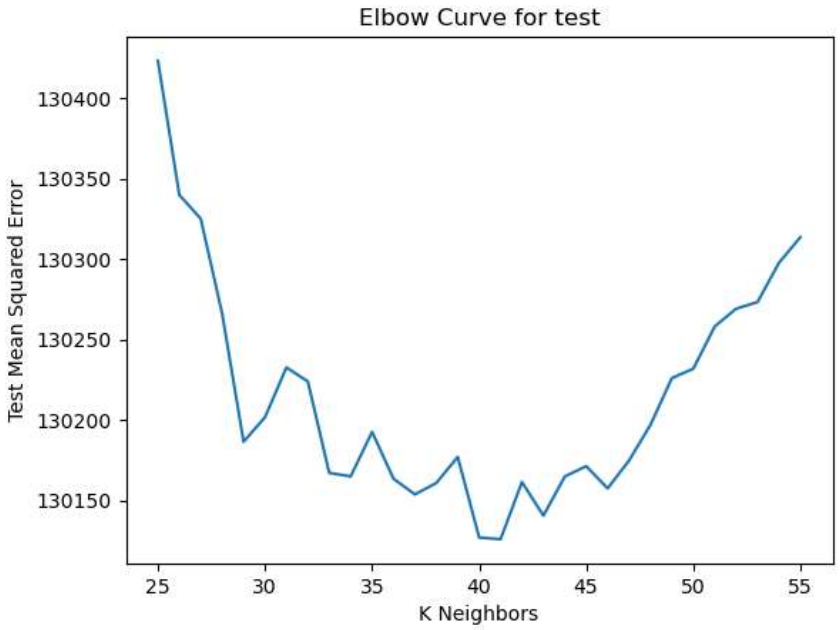
```
# calling above defined function
test = Elbow(k)
```

In [27]:

```
# plotting the Curves
plt.plot(k, test)
plt.xlabel('K Neighbors')
plt.ylabel('Test Mean Squared Error')
plt.title('Elbow Curve for test')
```

Out[27]:

```
Text(0.5, 1.0, 'Elbow Curve for test')
```



In [32]:

```
# Creating instance of KNN
reg = KNN(n_neighbors = 41)

# Fitting the model
reg.fit(train_x, train_y)

# Predicting over the Train Set and calculating F1
test_predict = reg.predict(test_x)
k = mse(test_predict, test_y)
print('Test MSE    ', k )
```

```
Test MSE     130125.76779783357
```

In [33]:

```
k = mae(test_predict, test_y)
print('Test MAE    ', k )
```

```
Test MAE     235.4292275718515
```

In [21]:

```
# Creating instance of KNN
reg = KNN(n_neighbors = 41)

# Fitting the model
reg.fit(train_x, train_y)

# Predicting over the Train Set and calculating F1
train_predict = reg.predict(train_x)
k = mse(train_predict, train_y)
print('Train MSE    ', k )
```

```
Train MSE     123573.0819688122
```

In [31]:

```
k = mae(train_predict, train_y)
print('Train MAE    ', k )
```

```
Train MAE     228.93482320977935
```

In [ ]:

```

```