Program: 10 implement the non-parametric **Locally Weighted Regression** algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

import numpy as np

import matplotlib.pyplot as plt

import pandas as pd

tou = 0.5

data=pd.read\_csv("lab10.csv")

X\_train = np.array(data.total\_bill)

print(X\_train)

X\_train = X\_train[:, np.newaxis]

print(len(X\_train))

y\_train = np.array(data.tip)

X\_test = np.array([i /10 for i in range(500)])

X\_test = X\_test[:, np.newaxis]

y\_test = []

count = 0

**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)**

**factor1 = np.linalg.inv(X\_train.T.dot(W).dot(X\_train))**

**parameters = factor1.dot(X\_train.T).dot(W).dot(y\_train)**

**prediction = X\_test[r].dot(parameters)**

**y\_test.append(prediction)**

**count += 1**

print(len(y\_test))

y\_test = np.array(y\_test)

plt.plot(X\_train.squeeze(), y\_train, 'o')

plt.plot(X\_test.squeeze(), y\_test, 'o')

plt.show()

**DATASET: [245 rows]**

total\_bill tip sex smoker day time size

16.99 1.01 Female No Sun Dinner 2

10.34 1.66 Male No Sun Dinner 3

21.01 3.5 Male No Sun Dinner 3

23.68 3.31 Male No Sun Dinner 2

24.59 3.61 Female No Sun Dinner 4

25.29 4.71 Male No Sun Dinner 4

8.77 2 Male No Sun Dinner 2

26.88 3.12 Male No Sun Dinner 4

15.04 1.96 Male No Sun Dinner 2

Output: