

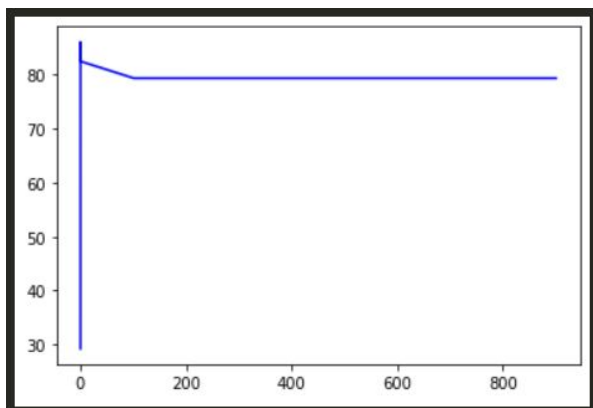
IRM2016502

Locally Weighted Regression

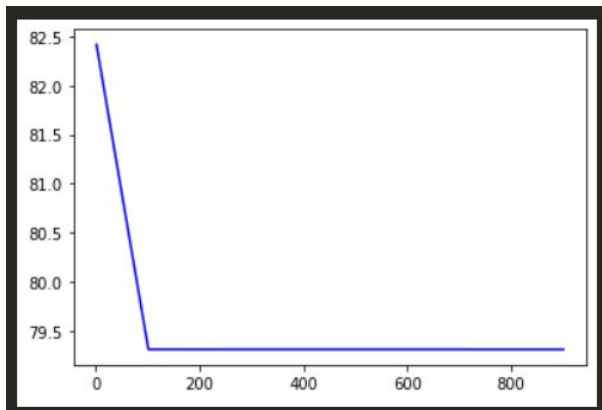
To perform LWR on Housing price dataset:

Normal Equation:

```
tau : 0.2 => accuracy : 29.24999329460327
tau : 0.30000000000000004 => accuracy : 86.02761544693705
tau : 0.4 => accuracy : 84.96775369195029
tau : 0.5 => accuracy : 84.97341806630456
tau : 0.6000000000000001 => accuracy : 84.45742577606093
tau : 0.7000000000000001 => accuracy : 83.82119492758649
tau : 0.8 => accuracy : 83.3209126173205
tau : 0.9 => accuracy : 82.85602140157293
tau : 1 => accuracy : 82.41544912713961
tau : 101 => accuracy : 79.31472698091288
tau : 201 => accuracy : 79.31428289820539
tau : 301 => accuracy : 79.31419978147089
tau : 401 => accuracy : 79.31417057836234
tau : 501 => accuracy : 79.31415703403286
tau : 601 => accuracy : 79.31414966733115
tau : 701 => accuracy : 79.31414522160924
tau : 801 => accuracy : 79.3141423343525
tau : 901 => accuracy : 79.31414035391266
```



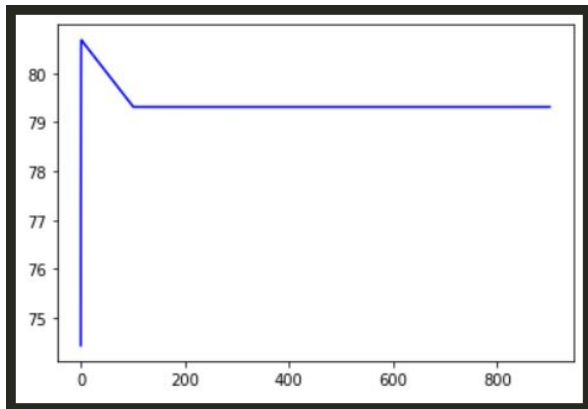
Considering tau between [0,1] also



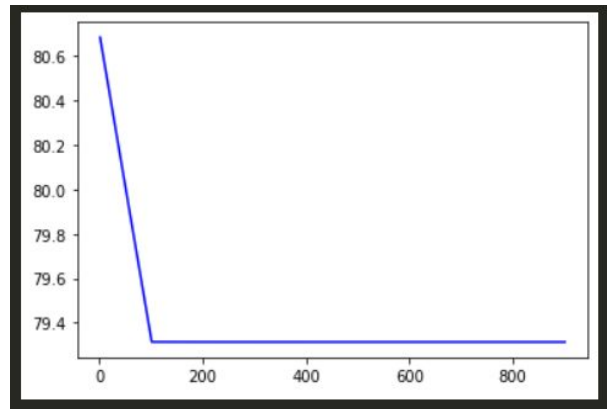
Not considering tau between [0,1]

Gradient Descent:

```
tau : 0.1 => accuracy : 74.42886926111794
tau : 0.2 => accuracy : 76.2518538586431
tau : 0.30000000000000004 => accuracy : 77.331869447052
tau : 0.4 => accuracy : 78.04291626946633
tau : 0.5 => accuracy : 78.79579577751721
tau : 0.6000000000000001 => accuracy : 79.57387344775113
tau : 0.7000000000000001 => accuracy : 80.15627521372295
tau : 0.8 => accuracy : 80.50289048350898
tau : 0.9 => accuracy : 80.65578594618006
tau : 1 => accuracy : 80.68390908856753
tau : 101 => accuracy : 79.3139347866378
tau : 201 => accuracy : 79.31349336322808
tau : 301 => accuracy : 79.3134107429118
tau : 401 => accuracy : 79.31338171412227
tau : 501 => accuracy : 79.31336825062425
tau : 601 => accuracy : 79.3133609278818
tau : 701 => accuracy : 79.31335650868728
tau : 801 => accuracy : 79.31335363865799
tau : 901 => accuracy : 79.31335167003463
```



Considering tau between $[0,1]$ also



Not considering tau between $[0,1]$

As τ decreases accuracy increases as τ defines the neighbourhood and as we search in its nearer neighbourhood the accuracy increases. But then also we get into the problem of overfitting the data. Hence appropriate τ value must be chosen.