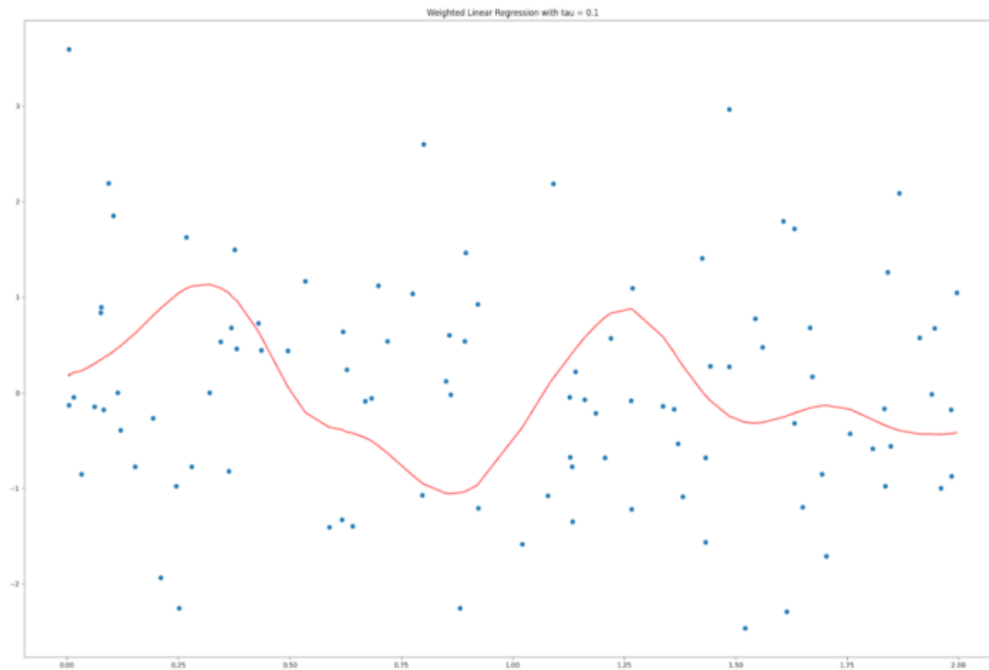


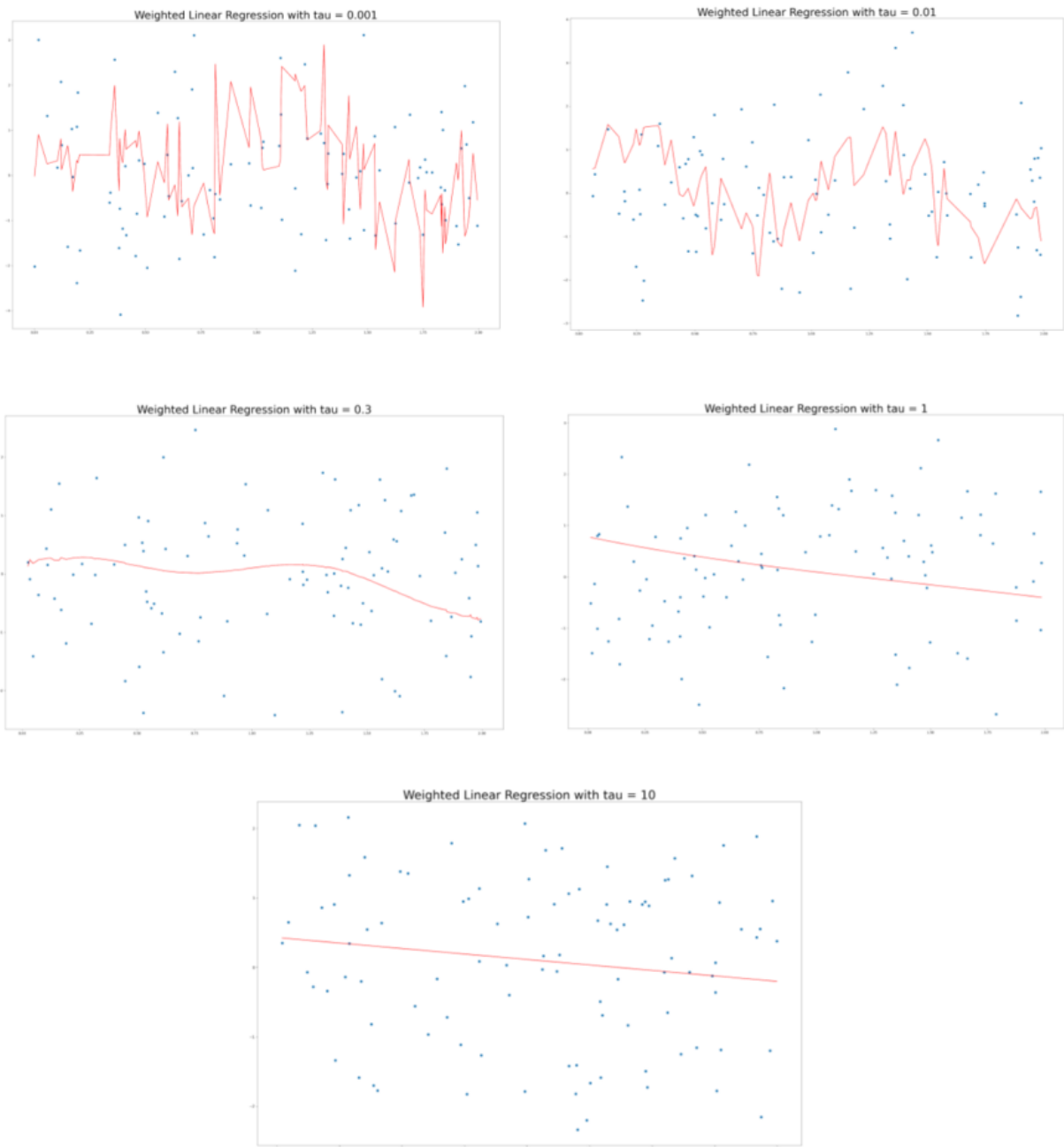
We were asked to implement Locally Weighted Linear Regression which is an algorithm that while minimizing the cost function and computing theta values we give a higher preference to the points in the training set that are closer to the query point that is given as a parameter. In this way, we get more accurate predictions and the model does not learn a fixed set of parameters as is done in linear regression. Therefore, we have calculated this by sending every x instance in the training set as a query point and observed the differences in the plots that occur with the change of tau values.

Part-A:

I have implemented the weighted linear regression code as explained in assignment and gave the given parameters. As a result we got a fit that looks like polynomial regression model that does not over or underfit our training data.



Part-B:



In this part, we have tried different tau parameters while doing predictions. As can be seen in figures, as the tau goes lower, we got more sensitive predictions and our plot become more complex as we compared it to value 10 which basically is a straight line. The tau parameter is called a hyperparameter, which means that it is a parameter of the model given by us and not learned by the model itself. This value is used while calculating the weight values and as it becomes bigger, more points are considered while making calculations. This increases the effect of points that are away from the query point and as a result our predictions are less accurate and similar to linear regression. Even though it is not very understandable from this random data generated by us, in different examples, by adjusting tau value in small values we can get a model that is as accurate as polynomial one which might tend to be overfitting.

