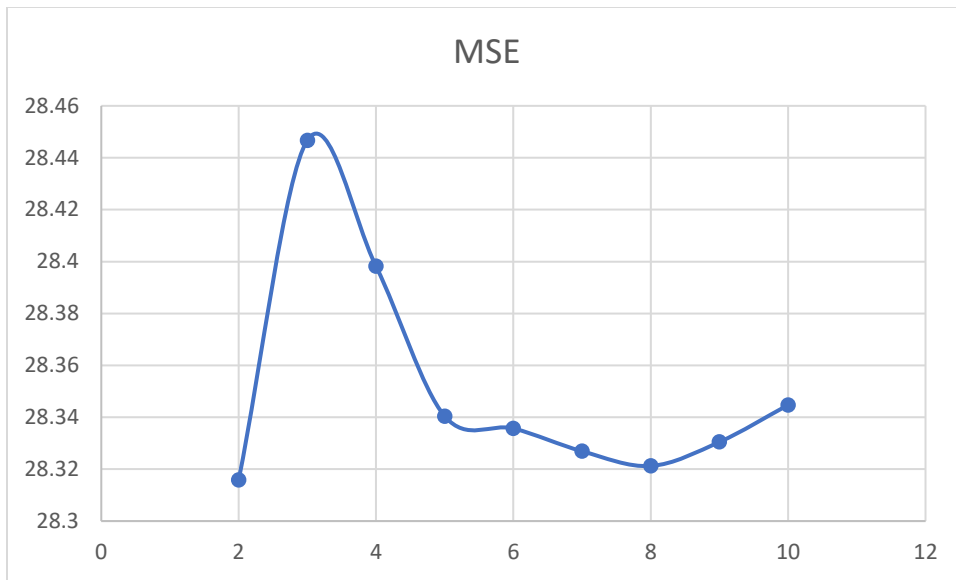For Task2:

MSE Plot:

RMSE Plot:
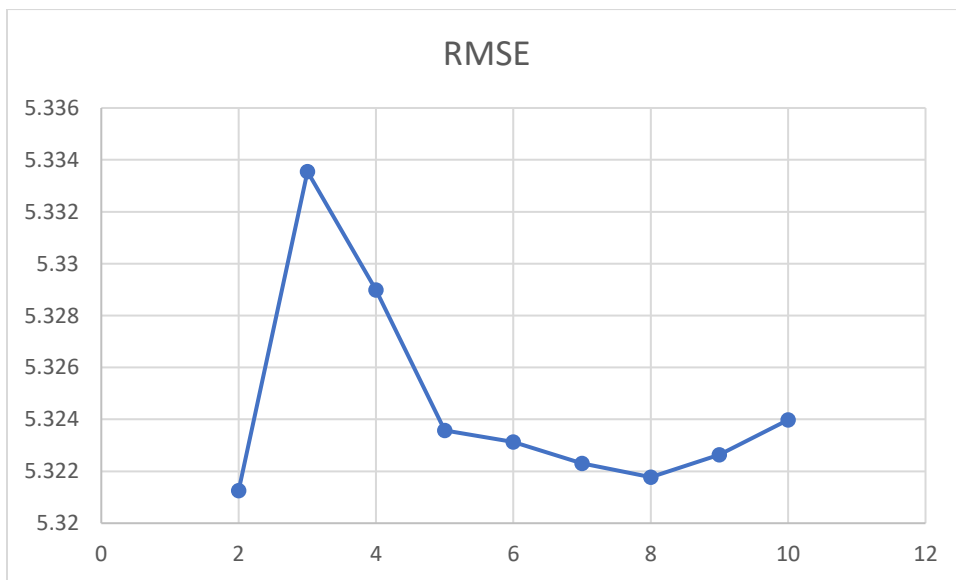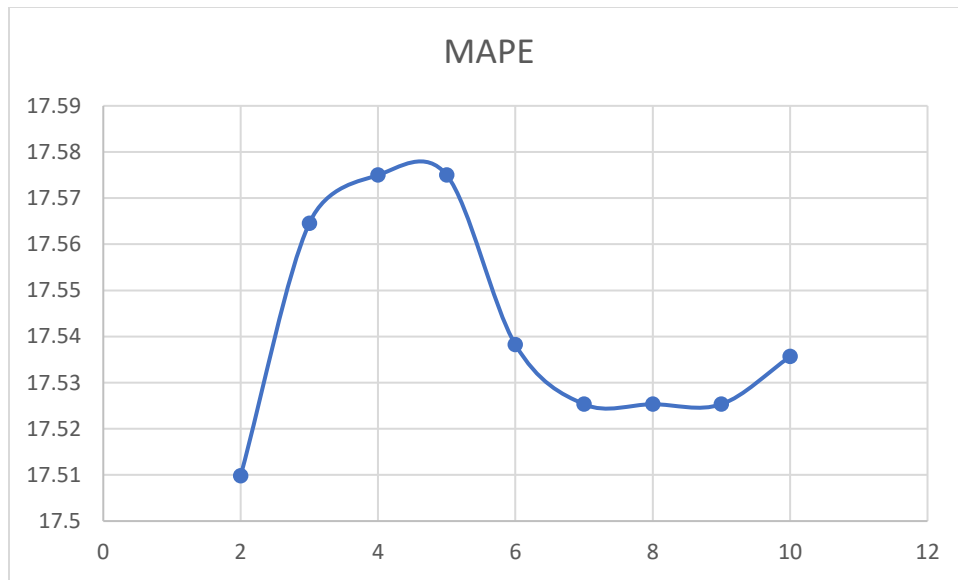
MAPE Plot:
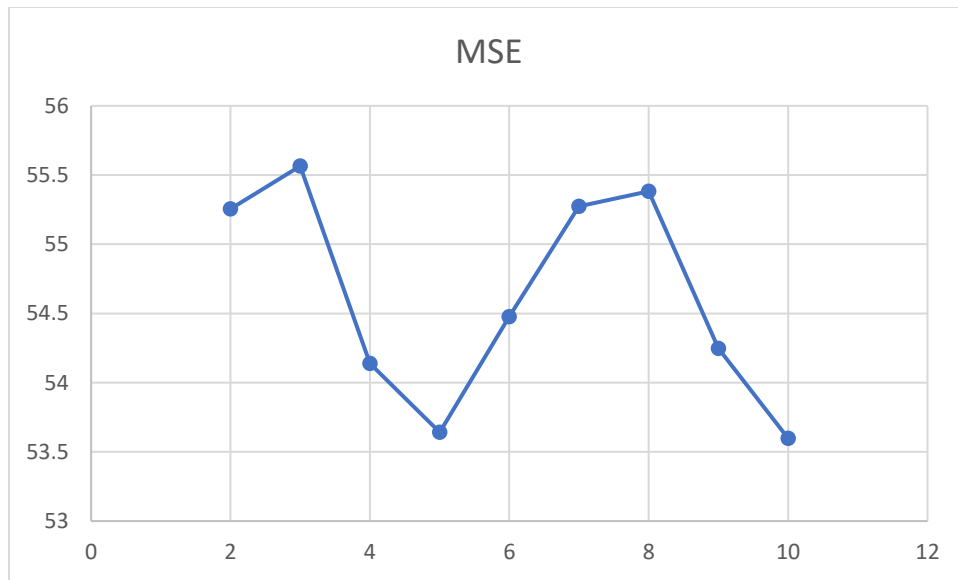

MAPE

Time Graph:

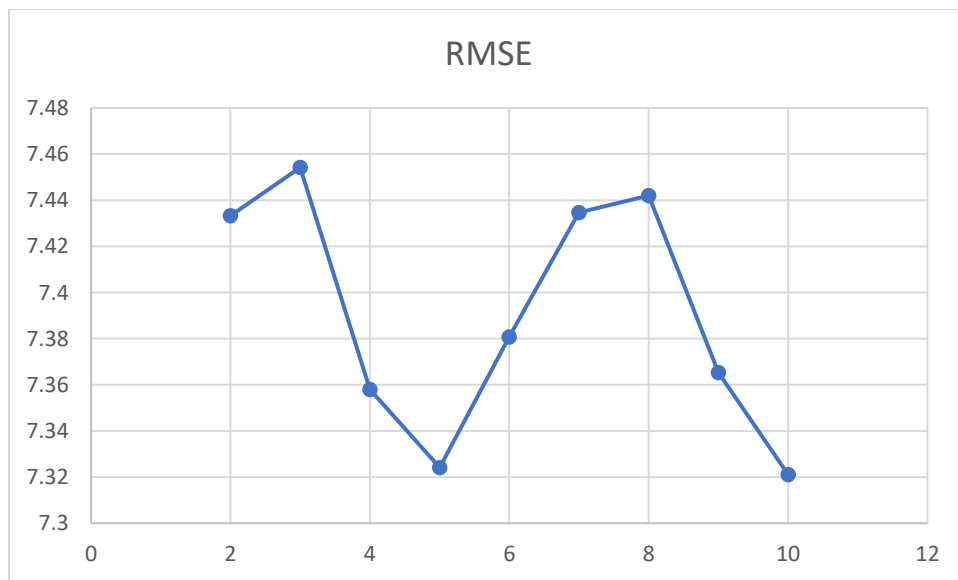| K	Time(sec)
2	0.6497883
3	0.7951783
4	0.5882551
5	0.6416747
6	0.585374
7	0.5352001
8	0.5013268
9	0.5842366
10	0.5842366

All graphs show a similar trend of K=2 being the best value for the lowest value of all graphs.
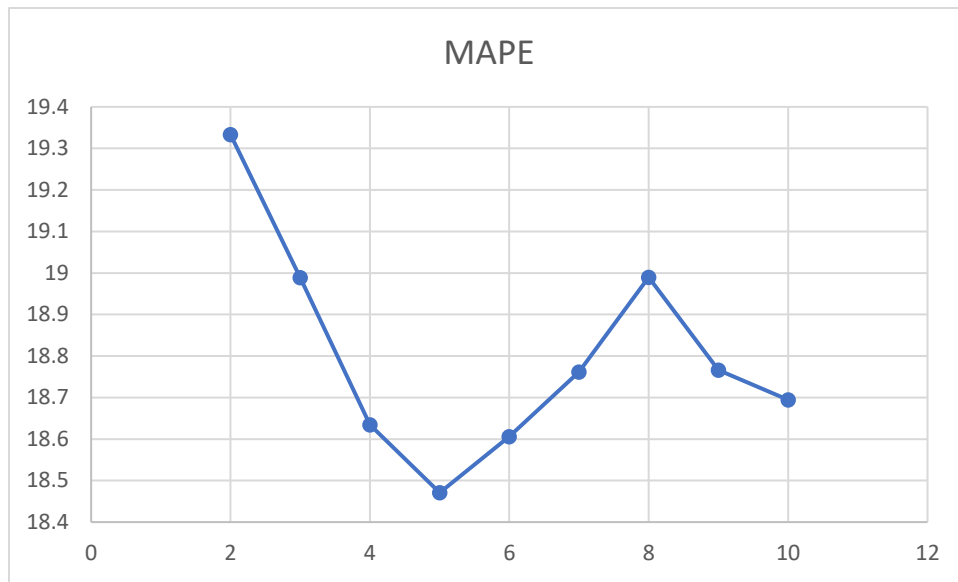
Task3:

MSE-Plot

RMSE-Plot

MAPE-Plot

MAPE

Time Graph

K	Time(sec)
2	0.007443
3	0.005588
4	0.009759
5	0.008983
6	0.006995
7	0.01122
8	0.006183
9	0.01146
10	0.007328

All graphs show a similar trend of K=5 being the best value for the lowest value of all graphs, although K=10 is also reduces the RMSE and MSE but it isn't as significant and almost as same as K=5.

The Difference in my Implementation and the SC-Kit Implementation being that my implementation has a lower error values for all K values hence my implementation is better in that sense, however my implementation takes significantly more time for the runs while the average time for my implementation is more that 0.5 sec, SCkit implementation takes less than 0.01 sec for each run. So it's about Time VS accuracy for a large amount of data and the need of accuracy need to be assessed to see which implementation is suitable.

For Decision Regressor Tree MSE-Value: 39.48287878787879

For Decision Regressor Tree RMSE-Value: 6.283540306855586

For Decision Regressor Tree MAPE-Value: 15.828381950381956

Time: 0.006444 sec

Decision Tree Regressor is a better choice as the MSE value is higher than my implementation it is certainly lower than KNN-Regressor , The error is also lower than Both implementations and the added advantage of quicker runtime , it is certainly the best of both worlds and hence the recommended choice.