Assignment 3

Aseel nemr : 206953127

Raafat Marzuq: 308169374

We worked on the code and answered the questions together on zoom .

The results that we got for every where k= 1,2,3…8 (train and test):

Train: 1 Rules

Error is 25.61%

Test:  1 Rules

Error is 25.05%

Train: 2 Rules

Error is 25.23%

Test:  2 Rules

Error is 28.67%

Train: 3 Rules

Error is 29.67%

Test:  3 Rules

Error is 38.80%

Train: 4 Rules

Error is 14.41%

Test:  4 Rules

Error is 25.81%

Train: 5 Rules

Error is 18.33%

Test:  5 Rules

Error is 27.87%

Train: 6 Rules

Error is 5.61%

Test:  6 Rules

Error is 19.27%

Train: 7 Rules

Error is 6.72%

Test:  7 Rules

Error is 21.29%

Train: 8 Rules

Error is 4.69%

Test:  8 Rules

Error is 17.15%

Questions :

1. Train behavior :

When we used two rules the error in the train set was slightly lower than the error of one rule , and when we used 3 rules the error was larger than the two rules error , but afterwards the error decreases until it gets to 4.69%.

Test behavior:

When we used two rules the error is also often larger than using one rule and when we used 3 rules we got the largest error afterwards decreases until it gets 17.15% .

1. After looking at the results ,we can see that the error of the train set gets lower as we add rules but in the test set it's not the same we see that the error is not decreasing when we add more rules , so we can see that there is overfitting.