

Introduction to Machine Learning – Sheet 2
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The results of our program were surprisingly similar for all depths. This finding applies to the range of standard deviations measured among all depths (between ± 0.025 and ± 0.0003) as well as the mean accuracy, which was close to 0.7 for all results. We would have expected the resulting metrics to become better (i.e. lead to a more precise classification) with a growing depth of the decision tree, at least up to a certain value for the depth, given the limited number of attributes in the car dataset. Our results, however, do not support that assumption.

Output of our program:

Std deviation with depth 3 in step 1 :-0.005902777777777812
Std deviation with depth 3 in step 2 :0.021874999999999978
Std deviation with depth 3 in step 3 :-0.009375000000000022
Std deviation with depth 3 in step 4 :0.007986111111111138
Std deviation with depth 3 in step 5 :-0.014583333333333282
Std deviation with depth 3 in step 6 :0.021874999999999978
Std deviation with depth 3 in step 7 :0.013194444444444509
Std deviation with depth 3 in step 8 :-0.026736111111111107
Std deviation with depth 3 in step 9 :-0.004166666666666652
Std deviation with depth 3 in step 10 :-0.00416666666666665
Mean Accuracy wo depth:0.6916666666666667

Std deviation with depth 5 in step 1 :0.021180555555555536
Std deviation with depth 5 in step 2 :0.009027777777777857
Std deviation with depth 5 in step 3 :-0.027430555555555514
Std deviation with depth 5 in step 4 :-0.006597222222222143
Std deviation with depth 5 in step 5 :0.010763888888888906
Std deviation with depth 5 in step 6 :0.002083333333333326
Std deviation with depth 5 in step 7 :-0.0048611111111111094
Std deviation with depth 5 in step 8 :3.472222222222765E-4
Std deviation with depth 5 in step 9 :-0.025694444444444464
Std deviation with depth 5 in step 10 :0.021180555555555536
Mean Accuracy wo depth:0.7114583333333333

Std deviation with depth 10 in step 1 :0.008333333333333304
Std deviation with depth 10 in step 2 :-3.472222222221655E-4
Std deviation with depth 10 in step 3 :-0.014236111111111116
Std deviation with depth 10 in step 4 :-0.005555555555555536
Std deviation with depth 10 in step 5 :0.017013888888888884
Std deviation with depth 10 in step 6 :-0.021180555555555536
Std deviation with depth 10 in step 7 :0.006597222222222254
Std deviation with depth 10 in step 8 :-0.015972222222222165
Std deviation with depth 10 in step 9 :0.015277777777777835
Std deviation with depth 10 in step 10 :0.010069444444444464
Mean Accuracy wo depth:0.7052083333333333

Std deviation with depth 20 in step 1 :-0.004166666666666652
Std deviation with depth 20 in step 2 :-0.016319444444444442
Std deviation with depth 20 in step 3 :-0.012847222222222232
Std deviation with depth 20 in step 4 :0.004513888888888928
Std deviation with depth 20 in step 5 :0.02013888888888893
Std deviation with depth 20 in step 6 :-0.004166666666666652
Std deviation with depth 20 in step 7 :0.004513888888888928
Std deviation with depth 20 in step 8 :-0.012847222222222232
Std deviation with depth 20 in step 9 :0.014930555555555558
Std deviation with depth 20 in step 10 :0.006250000000000089
Mean Accuracy wo depth:0.6986111111111111