

ADA BOOST ALGORITHM

A model is created for the Insurance calculation, using ADA boost algorithm. The R2_score for the dataset is captured for different parameters.

loss	n_estimators	learning_rate	random_state	R2_score
Linear	50	1.0	None	0.8489
	50	2.0	42	0.8632
	50	3.0	500	0.6545
	50	2.0	500	0.8833
Square	50	1.0	None	0.5222
	50	2.0	42	0.4934
	50	3.0	500	-0.0041
	50	2.0	500	0.4549
Exponential	50	1.0	None	0.6311
	50	2.0	42	0.5271
	50	3.0	500	0.4812
	50	2.0	500	0.5292

The default parameter values for Ada boost algorithm is n_estimators=50, learning_rate=1.0, loss='linear', random_state=None. **The R2_score for default value is 0.8489**

On Hypertuning the parameters, the highest performing parameter combinations are n_estimators=50, learning_rate=2.0, loss='linear', random_state=500, which gives **R2_score of 0.8833**

XG BOOST ALGORITHM

The R2_score for the different parameters are given in the table below

n_estimators	max_depth	eta	colsample_bytree	R2_score
1000	7	0.1	0.8	0.7866
1000	7	0.01	0.8	0.8551
1000	6	0.01	0.8	0.8648
1000	10	0.01	0.8	0.8407
1000	5	0.01	0.8	0.8749
1000	5	0.01	0.7	0.8780
1000	5	0.1	0.5	0.8804

The default parameter values for XG boost algorithm is n_estimators=1000, max_depth=7, eta=0.1, colsample_bytree=0.8. **The R2_score for default value is 0.7866**

On Hypertuning the parameters, the highest performing parameter combinations are n_estimators=1000, max_depth=5, eta=0.1, colsample_bytree=0.5, which gives **R2_score of 0.8804**

LG BOOST ALGORITHM

The R2_score for the different parameters are given in the below table

n_estimators	colsample_bytree	subsample_freq	R2_score
100	1	1	0.8653
30	1	1	0.8830
30	0.9	1	0.8824
30	1	2	0.8830

The default parameter values for LG boost algorithm is n_estimators=100, colsample_bytree=1, subsample_freq=1. **The R2_score for default value is 0.8653**

On Hypertuning the parameters, the highest performing parameter combinations are n_estimators=30, colsample_bytree=1, subsample_freq=2, which gives **R2_score of 0.8830**