

ASSIGNMENT -REGRESSION ALGORITHM

(Insurance Charges Prediction)

A) PROBLEM IDENTIFICATION:

1. DOMAIN SELECTION - MACHINE LEARNING
2. LEARNING SELECTION-SUPERVISED LEARNING
- 3.SUPERVISED LEARNING -REGRESSION

B)BASIC INFORMAION:

Dataset has 1338 Rows and 6 Columns.

C)PRE PROCESSING METHOD:

Dataset has two nominal data columns(sex_male,smoker_yes).so we convertednominal data to numerical data by using get_dummies.

D)MODELS RESULT:

SIMPLE LINEAR REGRESSION : **R2 SCORE=0.78**

MULTIPLE LINEAR REGRESSION:**R2 SCORE=0.78**

DECISION TREE: **R2 SCORE=0.74**

RANDOM FOREST: **R2 SCORE=0.87**

E)BEST MODEL:

RANDOM FOREST

R2 SCORE=0.87(criterion=squared_error, max_features= SQRT, n_estimators=50)

Decision Tree Parameters Values:

R2 SCORE=0.74(**POISSON,RANDOM,AUTO**)

critierion	splitter	max_featu res	R2 score
absolute_error	best	sqrt	0.58
absolute_error	best	auto	0.67
friedman_mse	best	auto	0.71
friedman_mse	randam	auto	0.68
friedman_mse	randam	sqrt	0.70
friedman_mse	randam	Log2	0.62
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friedman_mse	best	sqrt	0.73
friedman_mse	best	Log2	0.71
absolute_error	best	Log2	0.68

poisson	best	sqrt	0.58
poisson	best	Log2	0.57
poisson	best	auto	0.68
Poisson	random	auto	0.74
poisson	random	Log2	0.63
poisson	random	sqrt	0.65

Random Forest:

R2 SCORE=0.87(**criterion**=squared_error, **max_features**= SQRT, **n_estimators**=50)

criterion	bootstrap	max_features	n_estimators	random_state	R2 score
squared_error	True	1.0	50	0	0.84
squared_error	True	1.0	100	0	0.85
squared_error	True	sqrt	50	0	0.87
squared_error	True	Log2	50	0	0.87
poisson	True	1.0	50	0	0.78
poisson	True	1.0	100	0	0.78
poisson	bool	1.0	100	0	0.78
friedman_mse	True	1.0	50	0	0.84
friedman_mse	True	sqrt	50	0	0.87
friedman_mse	True	sqrt	100	0	0.87
friedman_mse	True	Log2	100	0	0.87
friedman_mse	True	Log2	50	0	0.87
absolute_error	True	1.0	50	0	0.85
absolute_error	True	1.0	100	0	0.85
absolute_error	True	sqrt	100	0	0.87
absolute_error	True	sqrt	50	0	0.87
absolute_error	True	Log2	50	0	0.87
absolute_error	True	Log2	100	0	0.87

Best Model :Random Forest

H HX B

