

Assignment-Regression Algorithm

Problem Statement or Requirement:

1) Identifying the problem statement:

A client's requirement is, he wants to **predict the insurance charges** based on the several parameters. The Client has provided the dataset of the same.

2) Basic information:

1) 100 rows

2) 6-columns

3) pre-processing method → Converting the column 2 & 5 into (converting string to number →) numerical value by NOMINAL DATA.

Function → `(get_dummies(dataset, drop_first=True))` using this function to convert.

4) To find the r^2 score value:

Check the and calculate in algorithm for creating the best model.

--→ To find the machine learning regression method using in r^2 value

-→ For upcoming all algorithm the same DATASET is used.

-→ **1. MULTIPLE LINEAR REGRESSION:** (R^2 value) = **0.72**

-→ **2. SUPPORT VECTOR MACHINE:**

sl.no	Hyper parameter	Linear (r value)	RBF (r value)	Poly (r value)	Sigmoid (r value)
1	C10	0.46	-0.032	0.038	0.039
2	C100	0.62	0.32	0.617	0.52
3	C500	0.76	0.66	0.82	0.44
4	C1000	0.76	0.81	0.85	0.28
5	C2000	0.74	0.85	0.86	-0.59
6	C3000	0.74	0.86	0.85	-2.12

-→ >> SUPPORT VECTOR MACHINE (R^2 value) of (**c=3000 & c=2000**) = **0.86**

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---→3.DECISION TREE:

Sl.no	CRITERION	MAX FEATURES	SPLITTER	R VALUE
1	<i>poisson</i>	Sqrt	Best	0.60
2	<i>poisson</i>	sqrt	Random	0.70
3	<i>absolute_error</i>	Sqrt	Best	0.73
4	<i>absolute_error</i>	Sqrt	Random	0.66
5	<i>absolute_error</i>	Log2	Best	0.64
6	<i>absolute_error</i>	Log2	Random	0.66
7	Squared_error	sqrt	random	0.68
8	<i>poisson</i>	Log2	best	0.70
9	Squared_error	Sqrt	Best	0.78
10	Squared_error	Sqrt	Random	0.68
11	Squared_error	Log2	Best	0.74
12	Squared_error	Log2	Random	0.70
13	Friedman_mse	Auto	Best	-
14	Friedman_mse	Auto	Random	-
15	Friedman_mse	Sqrt	Best	0.72
16	Friedman_mse	Sqrt	Random	0.60
17	Friedman_mse	Log2	Best	0.72
18	friedman_mse	Log2	random	0.70

-→>>DECISION TREE (R² VALUE) IS 0.78

--→4.Random forest value of r_score is 0.84

5)My final model is algorithm of SUPPORT VECTOR MACHINE because it gives accuracy of 0.86

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