

1. Problem Statement

To predict the Insurance Charges based on 5 datasets

Stage 1: Machine Language-Input and Out data are Numbers

Stage 2:

Supervised Learning – As Input and Output are very clear

Stage 3:

Category – Regression – As Data given are Continuous & Numerical

2. Multiple Linear Regression

r Value is = 0.7895

3. SVM Regression

r Value is = 0.8779 for kernel= rbf, c=10000

S.No	Hyper Parameter	Linear r Value	RBF(Non-Linear) r Value	Poly r Value	Sigmoid r Value
1	C10	0.4625	-.0323	0.0387	0.0393
2	C100	0.6288	0.3203	0.6179	0.5276
3	C1000	0.7649	0.8102	0.8566	0.2874
4	C3000	0.7414	0.8663	0.8599	-2.1244
5	C5000	0.7414	0.8747	0.8596	-7.53004
6	C10000	0.7414	0.8779	0.8592	-34.1515

4. Decision Tree Regression

r Value is = 0.7369 for criterion= poisson, *splitter=best*

S.No	Criterion	Max Features	Splitter	r Value
1	<i>absolute_error</i>	sqrt	best	0.6026
2	<i>absolute_error</i>	Log2	best	0.6015
3	<i>absolute_error</i>	-	best	0.6833
4	<i>absolute_error</i>	sqrt	random	0.6672
5	<i>absolute_error</i>	Log2	random	0.6874
6	<i>absolute_error</i>	-	random	0.7247
7	<i>poisson</i>	sqrt	best	0.7084
8	<i>poisson</i>	Log2	best	0.7197
9	<i>poisson</i>	-	<i>best</i>	0.7369
10	<i>poisson</i>	sqrt	random	0.6777
11	<i>poisson</i>	Log2	random	0.6853
12	<i>poisson</i>	-	random	0.6934
13	<i>squared_error</i>	sqrt	best	0.7051
14	<i>squared_error</i>	Log2	best	0.6766
15	<i>squared_error</i>	-	best	0.6854
16	<i>squared_error</i>	sqrt	random	0.6379
17	<i>squared_error</i>	Log2	random	0.6679
18	<i>squared_error</i>	-	random	0.7269
19	friedman_mse	sqrt	best	0.6388
20	friedman_mse	Log2	best	0.6947
21	friedman_mse	-	best	0.6866
22	friedman_mse	sqrt	random	0.6518
23	friedman_mse	Log2	random	0.6566
24	Friedman_mse	-	random	0.6768

5. Random Forest Regression

r Value is = 0.8715

This is the Best Model for Deployment

S.No	Criterion	Max Features	n_estimators	r Value
1	absolute_error	sqrt	50	0.8715
2	absolute_error	log2	50	0.8715
3	absolute_error	-	50	0.8536
4	absolute_error	sqrt	100	0.8713
5	absolute_error	log2	100	0.8713
6	absolute_error	-	100	0.8526
7	poisson	sqrt	50	0.8632
8	poisson	log2	50	0.8632
9	poisson	-	50	0.8493
10	poisson	sqrt	100	0.86802
11	poisson	log2	100	0.86802
12	poisson	-	100	0.8493
13	squared_error	sqrt	50	0.8695
14	squared_error	log2	50	0.8695
15	squared_error	-	50	0.8496
16	squared_error	sqrt	100	0.8709
17	squared_error	log2	100	0.8709
18	squared_error	-	100	0.8535
19	friedman_mse	sqrt	50	0.8705
20	friedman_mse	log2	50	0.8705
21	friedman_mse	-	50	0.8497
22	friedman_mse	sqrt	100	0.8712
23	friedman_mse	log2	100	0.8712
24	friedman_mse	-	100	0.8538