

Comparison of R score Value of different Machine Linear Regression algorithms for same dataset

1. Multiple Linear Regression- $r_score = 0.935$
2. Support Vector Machine

S.NO	Hyper Parameter "c" value	r_score linear	r_score rbf	r_score poly	r_score sigmoid
1	10	-0.039	-0.0568	-0.053	-0.054
2	100	0.106	-0.0507	-0.019	-0.030
3	1000	0.780	0.0067	0.266	0.185
4	2000	0.876	0.0675	0.481	0.397
5	5000	0.900	0.2124	0.793	0.730

Best Model, Parameter= "linear" with $c = 5000$, $r_score = 0.9$

3. Decision tree

S.no	Criterion	Splitter	Max_features	r_score
1	squared_error	best	None	0.913
2	squared_error	best	sqrt	0.824
3	squared_error	best	log2	0.584
4	squared_error	random	None	0.745
5	squared_error	random	sqrt	0.664
6	squared_error	random	log2	-0.024
7	friedman_mse	best	None	0.927
8	friedman_mse	best	sqrt	0.536
9	friedman_mse	best	log2	0.935
10	friedman_mse	random	None	0.898
11	friedman_mse	random	sqrt	0.138
12	friedman_mse	random	log2	0.488
13	absolute_error	best	None	0.943
14	absolute_error	best	sqrt	0.351
15	absolute_error	best	log2	0.0468
16	absolute_error	random	None	0.684
17	absolute_error	random	sqrt	0.639
18	absolute_error	random	log2	-0.373
19	poisson	best	None	0.918
20	poisson	best	sqrt	-0.830
21	poisson	best	log2	0.564
22	poisson	random	None	0.888
23	poisson	random	sqrt	0.738
24	poisson	random	log2	0.237

Best Model, Criterion= absolute_error, Splitter= best, Max_features= None, $r_score = 0.943$

4. Random Forest

S.no	Criterion	n_estimators	Max_features	r_score
1	squared_error	50	None	0.933
2	squared_error	50	sqrt	0.705
3	squared_error	50	log2	0.836
4	squared_error	100	None	0.944
5	squared_error	100	sqrt	0.782
6	squared_error	100	log2	0.848
7	friedman_mse	50	None	0.944
8	friedman_mse	50	sqrt	0.713
9	friedman_mse	50	log2	0.734
10	friedman_mse	100	None	0.944
11	friedman_mse	100	sqrt	0.810
12	friedman_mse	100	log2	0.817
13	absolute_error	50	None	0.936
14	absolute_error	50	sqrt	0.790
15	absolute_error	50	log2	0.837
16	absolute_error	100	None	0.937
17	absolute_error	100	sqrt	0.779
18	absolute_error	100	log2	0.822
19	poisson	50	None	0.925
20	poisson	50	sqrt	0.784
21	poisson	50	log2	0.770
22	poisson	100	None	0.930
23	poisson	100	sqrt	0.754
24	poisson	100	log2	0.764

Best Model, Criterion= friedman_mse, n_estimators=50,Max_features= None, r_score= 0.944

For the given input dataset, the best model for profit prediction is **Random Forest** with **r_score=0.944** using the following parameters, **Criterion=friedman_mse, n_estimators=50, Max_features= None.**