Machine Learning Regression Using R2 Value Method

1. **Multiple Linear Regression –> R2 Value is 0.9358**
2. **Support Vector Machine:**

S.No	Type of Regression	kernel	C	Hyper Tuned Parameters	r_Score
1	SVR	linear	10	regressor = SVR (kernel = 'linear', C = 10)	-0.0396
2	SVR	linear	100	regressor = SVR (kernel = 'linear', C = 100)	0.1065
3	SVR	linear	500	regressor = SVR (kernel = 'linear', C = 500)	0.5929
4	SVR	linear	1000	regressor = SVR (kernel = 'linear', C = 1000)	0.7803
5	SVR	linear	2000	regressor = SVR (kernel = 'linear', C = 2000)	0.8768
6	SVR	linear	5000	regressor = SVR (kernel = 'linear', C = 5000)	0.9004
7	**SVR**	**linear**	**10000**	**regressor = SVR (kernel = 'linear', C = 10000)**	**0.9240**
8	**SVR**	**rbf**	**10**	**regressor = SVR (kernel = 'rbf', C = 10)**	**-0.0568**
9	SVR	rbf	100	regressor = SVR (kernel = 'rbf', C = 100)	-0.0507
10	SVR	rbf	500	regressor = SVR (kernel = 'rbf', C = 500)	-0.0243
11	SVR	rbf	1000	regressor = SVR (kernel = 'rbf', C = 1000)	0.0068
12	SVR	rbf	2000	regressor = SVR (kernel = 'rbf', C = 2000)	0.0675
13	SVR	rbf	5000	regressor = SVR (kernel = 'rbf', C = 5000)	0.2124
14	SVR	rbf	10000	regressor = SVR (kernel = 'rbf', C = 10000)	0.3719
15	SVR	sigmoid	10	regressor = SVR (kernel = 'sigmoid', C = 10)	-0.0547
16	SVR	sigmoid	100	regressor = SVR (kernel = 'sigmoid', C = 100)	-0.0305
17	SVR	sigmoid	500	regressor = SVR (kernel = 'sigmoid', C = 500)	0.0706
18	SVR	sigmoid	1000	regressor = SVR (kernel = 'sigmoid', C = 1000)	0.1851
19	SVR	sigmoid	2000	regressor = SVR (kernel = 'sigmoid', C = 2000)	0.3971
20	SVR	sigmoid	5000	regressor = SVR (kernel = 'sigmoid', C = 5000)	0.7307
21	SVR	sigmoid	10000	regressor = SVR (kernel = 'sigmoid', C = 10000)	0.8535
15	SVR	poly	10	regressor = SVR (kernel = 'poly', C = 10)	-0.0537
16	SVR	poly	100	regressor = SVR (kernel = 'poly', C = 100)	-0.0198
17	SVR	poly	500	regressor = SVR (kernel = 'poly', C = 500)	0.1147
18	SVR	poly	1000	regressor = SVR (kernel = 'poly', C = 1000)	0.2662
19	SVR	poly	2000	regressor = SVR (kernel = 'poly', C = 2000)	0.4810
20	SVR	poly	5000	regressor = SVR (kernel = 'poly', C = 5000)	0.7937
21	SVR	poly	10000	regressor = SVR (kernel = 'poly', C = 10000)	0.8130

(**The Highest R2 Value is Highlighted in Color – Green** and **The Lowest R2 Value is Highlighted in Color – Red**)

3. **Decision Tree :**

S.No	Type of Regression	criterion	splitter	max_features	r_Score
1	DecisionTreeRegressor	squared_error	best	**NA**	0.9248
2	DecisionTreeRegressor	squared_error	random	**NA**	0.9089
3	DecisionTreeRegressor	friedman_mse	best	**NA**	0.9420

4	DecisionTreeRegressor	friedman_mse	random	NA	0.8794
5	DecisionTreeRegressor	absolute_error	best	NA	0.9526
6	DecisionTreeRegressor	absolute_error	random	NA	0.6585
7	DecisionTreeRegressor	poisson	best	NA	0.9275
8	**DecisionTreeRegressor**	**poisson**	**random**	**NA**	**0.9548**
9	DecisionTreeRegressor	squared_error	best	sqrt	0.6835
10	DecisionTreeRegressor	squared_error	random	sqrt	0.7867
11	DecisionTreeRegressor	friedman_mse	best	sqrt	0.1990
12	DecisionTreeRegressor	friedman_mse	random	sqrt	0.4602
13	DecisionTreeRegressor	absolute_error	best	sqrt	0.7144
14	DecisionTreeRegressor	absolute_error	random	sqrt	0.3191
15	DecisionTreeRegressor	poisson	best	sqrt	0.1162
16	DecisionTreeRegressor	poisson	random	sqrt	0.9501
17	DecisionTreeRegressor	squared_error	best	log2	0.6744
18	DecisionTreeRegressor	squared_error	random	log2	0.2310
19	DecisionTreeRegressor	friedman_mse	best	log2	0.7568
20	DecisionTreeRegressor	friedman_mse	random	log2	0.2631
21	DecisionTreeRegressor	absolute_error	best	log2	0.7927
22	**DecisionTreeRegressor**	**absolute_error**	**random**	**log2**	**-0.0389**
23	DecisionTreeRegressor	poisson	best	log2	0.7719
24	DecisionTreeRegressor	poisson	random	log2	0.5237

(**The Highest R2 Value is Highlighted in Color – Green** and **The Lowest R2 Value is Highlighted in Color – Red**)

---

4. Random Forest :

S.No	Type of Regression	n_estimators	random_state	criterion	max_features	r_Score
1	RandomForestRegressor	50	0	squared_error	None	0.9446

2	RandomForestRegressor	100	0	squared_error	None	0.9460
3	RandomForestRegressor	50	0	friedman_mse	None	0.9389
4	RandomForestRegressor	100	0	friedman_mse	None	0.9413
5	RandomForestRegressor	50	0	absolute_error	None	0.9402
6	RandomForestRegressor	100	0	absolute_error	None	0.9459
7	**RandomForestRegressor**	**50**	**0**	**poisson**	**None**	**0.9464**
8	RandomForestRegressor	100	0	poisson	None	0.9414
9	**RandomForestRegressor**	**50**	**0**	**squared_error**	**sqrt**	**0.6830**
10	RandomForestRegressor	100	0	squared_error	sqrt	0.7592
11	RandomForestRegressor	50	0	friedman_mse	sqrt	0.6889
12	RandomForestRegressor	100	0	friedman_mse	sqrt	0.7609
13	RandomForestRegressor	50	0	absolute_error	sqrt	0.7222
14	RandomForestRegressor	100	0	absolute_error	sqrt	0.7857
15	RandomForestRegressor	50	0	poisson	sqrt	0.7209
16	RandomForestRegressor	100	0	poisson	sqrt	0.7718
17	RandomForestRegressor	50	0	squared_error	log2	0.6830
18	RandomForestRegressor	100	0	squared_error	log2	0.7592
19	RandomForestRegressor	50	0	friedman_mse	log2	0.6889
20	RandomForestRegressor	100	0	friedman_mse	log2	0.7609
21	RandomForestRegressor	50	0	absolute_error	log2	0.7222

22	RandomForestRegressor	100	0	absolute_error	log2	0.7857
23	RandomForestRegressor	50	0	poisson	log2	0.7209
24	RandomForestRegressor	100	0	poisson	log2	0.7718

(**The Highest R2 Value is Highlighted in Color – Green** and **The Lowest R2 Value is Highlighted in Color – Red**)