Name : A.Barkathulla

To find the following the machine learning regression method using r2 value

1. **Multiple Linear Regression**(R^2 value)= **0.935868097004624**
2. **Support Vector Machine**

Sl.No.	Hyper parmeter	Linear	rbf	Poly	sigmoid
1	C=1	0.895077923	-0.057317309	-0.050890118	-0.057499197
2	C=10	-2.437215037	-0.055800923	0.025312389	-0.057615386
3	C=100	-357.0795147	-0.03023556	0.465662634	-0.058780024
4	C=500		0.050018181	0.620773805	-0.064016657
5	C=1000	-36014.02058	0.160600292	0.640323938	-0.070701273
6	C=2000		0.288395441	0.671747715	-0.084533254
7	C=3000		0.395140856	0.690998545	-0.098982232

The SVM Regression use R^2 value(Linear and hyper parameter (c1) = **0.895077923**

3. **Decision Tree**

Sl.No.	CRITERIAN	MAX FEATURES	SPLITTER	R_VAALUE
1	**squared_error**	None	best	0.929771464
2	**squared_error**	None	random	0.710480582
3	**squared_error**	sqrt	best	0.72149386
4	**squared_error**	sqrt	random	0.659990407
5	**squared_error**	log2	best	0.697858344
6	**squared_error**	log2	random	0.753304161
7	**friedman_mse**	None	best	0.946496311
8	**friedman_mse**	None	random	0.761292183
9	**friedman_mse**	sqrt	best	0.059908185
10	**friedman_mse**	sqrt	random	0.27648082
11	**friedman_mse**	log2	best	0.561691501
12	**friedman_mse**	log2	random	0.709178623
13	**absolute_error**	None	best	0.962373806
14	**absolute_error**	None	random	0.931751668
15	**absolute_error**	sqrt	best	0.552159137
16	**absolute_error**	sqrt	random	0.555381088
17	**absolute_error**	log2	best	-0.906443655
18	**absolute_error**	log2	random	0.632805257
19	**poisson**	None	best	0.918744895
20	**poisson**	None	random	0.872307635
21	**poisson**	sqrt	best	0.383493983
22	**poisson**	sqrt	random	-0.415629226
23	**poisson**	log2	best	0.411697943
24	**poisson**	log2	random	0.745410817

The Decision Tree Regression use R^2 value (absolute_error,None,best) = **0.962373806**

4. Random Forest

Sl.No.	CRITERIAN	MAX FEATURES	n_estimator	R_VAALUE
1	**squared_error**	None	100	0.946004355
2	**squared_error**	None	50	0.944633639
3	**squared_error**	sqrt	100	0.75915045
4	**squared_error**	**sqrt**	50	0.683002237
5	**squared_error**	log2	100	0.75915045
6	**squared_error**	**log2**	50	0.683002237
7	**friedman_mse**	None	100	0.941270197
8	**friedman_mse**	None	50	0.938895763
9	**friedman_mse**	sqrt	100	0.760859221
10	**friedman_mse**	**sqrt**	50	0.688918213
11	**friedman_mse**	log2	100	0.760859221
12	**friedman_mse**	**log2**	50	0.688918213
13	***absolute_error***	None	100	0.945909746
14	***absolute_error***	None	50	0.940193525
15	***absolute_error***	sqrt	100	0.785748335
16	***absolute_error***	**sqrt**	50	0.722235187
17	***absolute_error***	log2	100	0.785748335
18	***absolute_error***	**log2**	50	0.722235187
19	**poisson**	None	100	0.941388942
20	**poisson**	None	50	0.946354971
21	**poisson**	sqrt	100	0.771764207
22	**poisson**	**sqrt**	50	0.720862467
23	**poisson**	log2	100	0.771764207
24	**poisson**	**log2**	50	0.720862467

The Random forest Regression use R^2 value (poisson,Nonen_feature=50)= **0.94635497053**

Compare Best model

S.no	Model	R2_value
1	MLR	**0.935868097004624**
2	SVM	0.895077923
3	Decision Tree	0.962373806
4	Random Forest Tree	0.946354971

Best Moel is Decision Tree Regression use R^2 value (absolute_error, None , best) = **0.962373806**