Regression Assignment

1) Problem statement:
   - Domain Selection: ML
   - Learning Selection: Supervised
   - Supervised:Regression

2) Total. no. of. rows=1338 & Total . no . of .columns=6
3) Pre-processing method: Nominal data
4) ML regression method using r2_score:
   - Multiple linear regression(r2_score)=0.789479
   - Support vector machine:

S.no	Hyper parameter	Linear (r value)	Rbf(r value)	Poly(r value)	Sigmoid(r value)
1.	C=10	0.56651	-0.0181	0.15939	0.07305
2.	C=100	0.63595	0.39060	0.75081	0.52756
3.	C=500	0.76514	0.69646	0.85931	0.49063
4.	C=1000	0.74409	0.82835	0.86058	0.14377
5.	C=2000	0.74142	0.86073	0.86018	-2.58403
6.	C=3000	0.74142	0.86853	0.86001	-6.82618
7.	C=5000	0.74142	0.87357	0.85886	-17.5541

   - Decision Tree:

S.no	criterion	splitter	Max_features	R value
1.	friedman_mse	Random	sqrt	0.67412
2.	friedman_mse	Random	Log2	0.61141
3.	friedman_mse	best	Log2	0.70309
4.	friedman_mse	best	sqrt	0.70163
5.	Squared_error	Random	sqrt	0.63509
6.	Squared_error	random	Log2	0.59990
7.	Squared_error	best	sqrt	0.74482
8.	Squared_error	best	Log2	0.72370
9.	Absolute_error	Random	Sqrt	0.67258
10	Absolute_error	Random	Log2	0.43054
11.	Absolute_error	Best	Sqrt	0.67774
12.	Absolute_error	best	Log2	0.69085

13.	poisson	Random	sqrt	0.70188
14.	poisson	Random	Log2	0.71579
15.	poisson	Best	Sqrt	0.66485
16.	poisson	best	Log2	0.75188

- Random forest:

S.no	criterion	N_estimators	Max_features	R value
1.	poisson	10	sqrt	0.86132
2.	poisson	100	sqrt	0.86806
3.	poisson	10	Log2	0.86188
4.	poisson	100	Log2	0.87082
5.	Squared_error	10	sqrt	0.85083
6.	Squared_error	100	Sqrt	0.87211
7.	Squared_error	10	Log2	0.84870
8.	Squared_error	100	Log2	0.87161
9.	Absolute_error	10	Log2	0.86276
10.	Absolute_error	100	Log2	0.87291
11.	Absolute_error	10	Sqrt	0.86085
12.	Absolute_error	100	sqrt	0.87210
13.	friedman_mse	10	sqrt	0.85530
14.	friedman_mse	100	sqrt	0.86842
15.	friedman_mse	10	Log2	0.85413
16.	friedman_mse	100	Log2	0.86945

The final Model of ML:

- Support Vector Machine (R2_value)[c=5000,rbf] = 0.87357

                Or

- Random Forest (R2_value)[absolute_error,log2,100] =0.87291