Regression Assignment

1.Name of the Project:

Insurance Prediction

2.Stage 1:

Domain: Machine Learning

Stage 2:

Learning: Supervised Learning

Stage 3:

Regression

1.Multiple Linear Regression:

Find the Best Model for **Multiple Linear Regression** using different Parameter to get different R2 Value: (Hyper Tunning Parameter)

R2value for the Model= 0.7894790349867009

2.Support Vector Machine:

Find the Best Model for **Support Vector Machine** using different Parameter to get different R2 Value: (Hyper Tunning Parameter)

S.No	Hyper Tunning Parameter	Linear	rbf	Poly	Sigmoid
1	C=10	0.4624684142339 68	-0.0322732939067 1052	0.0387162227602 31456	0.0393071437827434 7
2	C=100	0.6288792857320 358	0.3200317832050 832	0.6179569624059 795	0.5276103546510404
3	C=1000	0.7414188977179 843	0.8102064908497 452	0.8566487675946 568	0.2874706948697683
4	C=10000	0.7414230132435 738	0.8779952394739 162	0.8591715079473 909	-34.151535978496256
5	C=100000	0.7414188977179 843	0.8724984441820 819	0.8577881132290 369	-3432.3187498077446

R2 value for the Support Vector Machine=0.8591715079473909

Regression Assignment

3.Descison Tree:

Find the Best Model for **Decision Tree** using different Parameter to get different R2 Value: (Hyper Tunning Parameter)

S.NO	Criterion	Splitter	Max_Features	R2 Value
1.	squared_error	best	auto	0.6895790751354043
2.	friedman_mse	best	auto	0.6963806349923684
3.	absolute_error	best	auto	0.6563665324826058
4.	Poisson	best	auto	0.6765277216587837
5.	squared_error	random	auto	0.7310709719271218
6.	friedman_mse	random	auto	0.6957290959782847
7.	absolute_error	random	auto	0.7158032209785774
8.	Poisson	random	auto	0.6685531227801922
9.	squared_error	best	sqrt	0.6679876711117958
10.	friedman_mse	best	sqrt	0.7275632815217836
11.	absolute_error	best	sqrt	0.6724664869263924
12.	Poisson	best	sqrt	0.6397891283331316
13.	squared_error	random	sqrt	0.705478741987095
14.	friedman_mse	random	sqrt	0.5646967613838199
15.	absolute_error	random	sqrt	0.5646967613838199
16.	Poisson	random	sqrt	0.6370670965924758
17.	squared_error	best	log2	0.7488790203888427
18.	friedman_mse	best	log2	0.6752179584365661
19.	absolute_error	best	log2	0.7617606229934244
20.	Poisson	best	log2	0.7109588520250636
21.	squared_error	random	log2	0.6347575260245089
22.	friedman_mse	random	log2	0.6802753879963074
23.	absolute_error	random	log2	0.6290054031170031
24.	Poisson	random	log2	0.6157505915205015

R2 Value for the Decision Tree =0.7617606229934244

Regression Assignment

4.Random Forest Regressor: n_estimators=100

Find the Best Model for **Random Forest Regressor** using different Parameter to get different R2 Value: (Hyper Tunning Parameter)

S.NO	Criterion	Max_Features	R2 Value
1.	squared_error	sqrt	0.871463478275109
2.	friedman_mse	sqrt	0.8713498947989694
3.	absolute_error	sqrt	0.8712764184015294
4.	Poisson	sqrt	0.8292506547085357
5.	squared_error	log2	0.871463478275109
6.	friedman_mse	log2	0.8713498947989694
7.	absolute_error	log2	0.8712764184015294
8.	Poisson	log2	0.8292506547085357
9.	squared_error	1.0	0.8537036640729467
10.	friedman_mse	1.0	0.8541706813493263
11.	absolute_error	1.0	0.8517950369800487
12.	Poisson	1.0	0.8331354385838652

Final Model for insurance,pre.csv Random Forest Regressor

(criterion='squared_error',n_estimators=100,Maxfeature='sqrt')

Final Model - R2 value=0.871463478275109