

# Assignment-Regression Algorithm

## 1.Problem Statement:

The problem statement is Insurance charge prediction.

## 2.Basic Information About Dataset:

- The dataset has 1338 rows and 6 columns,
- It has 2 object columns,
- It does not have any null values,
- That 2 object columns are in nominal categories.

## 3.Pre-Process:

- Since it has 2 object column, so we need to change into numeric category, so here I used get\_dummies function that is used to change the data from string to numeric.
- The object column has how many category in the column this function change into column.

## 4.Using algorithm and Select The Best Model:

### Algorithms:

- Linear Regression
- Support Vector Machine Regression
- Decision Tree Regression
- Random Forest Regression

### Best Model:

- Random Forest Regression
- R2\_score is 0.857188792260074

## 5.Hyper Tuning The Model:

- Support Vector Machine:

Hyper tuning	Liner R2 score	Rbf R2 score	Poly R2 score	Sigmoid R2 score
C=1	0.11153645400200585	0.08844250999130221	0.06456982885737417	0.08994346957721744

<b>C=10</b>	- 0.001701922164501 1573	- 0.08188099505418 855	- 0.093099033995141 41	- 0.09093075300415 654
<b>C=100</b>	0.543221029625509	- 0.12450697022511 292	-0.099238575921484	- 0.11850300514767 609
<b>C=100 0</b>	0.633867642690701 7	- 0.11761756075675 889	- 0.054656238441107 785	- 1.71123067017426 8
<b>C=200 0</b>	0.689865681848145 8	- 0.10789588180042 786	- 0.001644488593601 7783	- 5.81905140101882 4

- Decision Tree Regression:**

Hyper Tuning	Best	Random
<b>Squard_error</b>	0.6853929611148636	0.7136673777311497
<b>Friedman_mse</b>	0.7035115242265604	0.7553651044987816
<b>Absolute_error</b>	0.7122197459942505	0.7097883877331236
<b>Poisson</b>	0.6885518858152145	0.6618545493945871

- Random Forest Regression:**

Hyper Tuning	Squard_error	Friedman_mse	Absolute_error	Poisson
n_estimators=100	0.8495405267588 179	0.8497408161149 084	0.8559045679543 424	0.8500111541415 122
n_estimators=1000	0.8520068982644 705	0.8521401722278 331	0.8575465261063 395	0.8540849675044 023

**Console:**

Finally the good model is Random Forest Regression that accuracy is 0.857188792260074