ARTIFICIAL INTELLIGENCE

ASSIGNMENT-REGRESSION ALGORITHM

PROBLEM STATEMENT OR REQUIREMENT:

1. Identify your problem statement.

Answer: We have been given with dataset that is provided by the client. The clients requirement is that he wants to predict the insurance charges based on several parameters. While looking at the dataset we can able to understand that it comes under Machine learning because all the data/input is given in number format. Stage 2 would be of learning selection. We can consider this as Supervised learning because the clients requirement are clear and the inputs and outputs are clear.

1. Tell the basic info about the dataset.

It consists of 6 columns that is age, sex, BMI, children, smoker, charges and it has 1339 rows.

1. Based on the given data I have worked in Multiple linear regression, Support Vector Machine, Decision tree and Random forest Regressions.
2. All the research values are (r2\_score of the models) mentioned below.

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| R2\_score of regression | R2\_score |
| Multiple linear regression | 0.789479 |
| SVM, kernel=”linear | -0.11161 |
| SVM, kernel=”rbf” | -0.081969 |
| SVM, kernel= “rbf”, C=10.00 | -0.081969 |
| SVM, kernel=”linear” ,c=10.00 | 0.001617 |
| Using standardisation | 0.46246 |
| SVM, kernel=”poly”, C=10.00 | 0.38716 |
| Decision tree | 0.68741 |
| Decision tree, criterion=’friedman\_mse’, splitter= ‘best’, | 0.74519 |
| Decision tree, criterion=’poisson’, splitter=’best’ | 0.74519 |
| Decision tree, criterion=’squared\_error’, splitter= ‘random’. | 0.74738 |
| Decision tree, criterion=’friedman\_mse’, splitter=’random’. | 0.7332 |
| Decision tree, criterion=’poisson’, splitter=’random’. | 0.7368 |
| Random forest(n\_estimators=50,random  State=0) | 0.8496375 |
| Random forest  (n\_estimators=100, random\_state=0) | 0.853703 |

1. Final model would be Random forest with n\_estimators=100,random\_state=0. Because comparing to all other regressions. Random forest regression r2\_score value is 0.853703 comparing to all other r2\_score values.