**Insurance Prediction**

**Domain Selection**

**Stage1:** Identified the problem statement from the given summary, as the requirement deals with Number we are going with **Machine Learning**, if prediction was not as expected then we might go to the Deep learning.

**Stage2:** Requirement is to Predict the Insurance amount, all the Dataset has features and the Label, so we are going with the **Supervised learning**

**Stage3:** Datasets contain the Numerical values as the prediction and so we are going with **Regression method**

Identify your problem statement – Need to **predict the insurance charges** based on the given features as inputs

Tell basic info about the dataset – **5 features, 1 Label, 1338 set of data**

Mention the pre-processing method – we have **sex and smoker** for pre-processing

**Multiple linear Regression**

|  |  |
| --- | --- |
| LinearRegression | R2 Score |
| 0.789479035 |

Simple Vector Machine

|  |  |  |  |
| --- | --- | --- | --- |
| SVR | **Kernal** | **C (Penalty)** | **R2Score** |
|  |  |  |
| linear | 0.1 | -0.122076684 |
| 1 | -0.111661287 |
| 10 | -0.001617632 |
| 100 | 0.54328182 |
| poly | 0.1 | -0.086252517 |
| 1 | -0.064292584 |
| 10 | -0.093116155 |
| 100 | -0.099761723 |
| rbf | 0.1 | -0.089576246 |
| 1 | -0.088427328 |
| 10 | -0.081969104 |
| 100 | -0.124803678 |

Decision Tree

|  |  |  |  |
| --- | --- | --- | --- |
| DecisionTreeRegressor | **criterion** | **splitter** | **R2Score** |
| squared\_error | best | 0.679186778 |
| random | 0.726571492 |
|  |  |  |
| friedman\_mse | best | 0.686737235 |
| random | 0.717744028 |
|  |  |  |
| absolute\_error | best | 0.654402666 |
| random | 0.760903954 |
|  |  |  |
| poisson | best | 0.731579548 |
| random | 0.681609192 |

Random Forest

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RandomForestRegressor | **criterion** | **n\_estimators** | **random\_state** | **R2Score** |
| squared\_error | 10 | 0 | 0.83303 |
| 50 | 0 | 0.849833 |
| 100 | 0 | 0.853831 |
| friedman\_mse | 10 | 0 | 0.833166 |
| 50 | 0 | 0.850072 |
| 100 | 0 | 0.854052 |
| absolute\_error | 10 | 0 | 0.835064 |
| 50 | 0 | 0.852666 |
| 100 | 0 | 0.852009 |
| poisson | 10 | 0 | 0.831399 |
| 50 | 0 | 0.849108 |
| 100 | 0 | 0.852633 |