**Assignment**

**A client’s requirement is, he wants to predict the insurance charges based on the several parameters. The Client has provided the dataset of the same.**

**Problem Statement:**

A client’s requirement is, he wants to predict the insurance charges based on the several parameters. The Client has provided the dataset of the same.

This is a **Machine Learning-supervised regression** problem

**MULTIPLE LINEAR REGRESSION**: R2 Value: 0.7894790349867009

A screenshot of a computer code

AI-generated content may be incorrect.

**SUPPORT VECTOR MACHINE:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.NO** | **HYPER PARAMETER** | **LINEAR (R VALUE)** | **RBF (NON LINEAR) (R VALUE)** | **POLY**  **(R VALUE)** | **SIGMOID**  **(R VALUE)** |
| 1 | C10 | 0.4624684142339678 | -0.03227329390671052 | 0.038716222760231456 | 0.03930714378274347 |
| 2 | C100 | 0.6288792857320361 | 0.3200317832050831 | 0.6179569624059799 | 0.5276103546510411 |
| 3 | C500 | 0.7631057975975388 | 0.6642984645143137 | 0.8263683541268937 | 0.4446061033869477 |
| 4 | C1000 | 0.7649311738597271 | 0.8102064851758545 | 0.8566487675946572 | 0.2874706948697683 |
| 5 | C2000 | 0.7440418308108325 | 0.854776642539298 | 0.8605579258597758 | -0.5939509731283512 |
| 6 | C3000 | 0.741423659924886 | 0.8663393953081688 | 0.8598930084494366 | -2.124419478668987 |

**DECISION TREE**:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.NO** | **CRITERION** | **MAX FEATURES** | **SPLITTER** | **R VALUE** |
| 1 | friedman\_mse | None | best | 0.6901970325184579 |
| 2 | friedman\_mse | None | Random | 0.677328661005822 |
| 3 | friedman\_mse | Sqrt | Best | 0.718272824517818 |
| 4 | friedman\_mse | Sqrt | Random | 0.6927110759270196 |
| 5 | friedman\_mse | Log2 | Best | 0.6825629176927084 |
| 6 | friedman\_mse | Log2 | Random | 0.7353003413033988 |
| 7 | Squared\_error | None | Best | 0.6935912938945752 |
| 8 | Squared\_error | None | Random | 0.6699839735398004 |
| 9 | Squared\_error | Sqrt | Best | 0.7321748680398932 |
| 10 | Squared\_error | Sqrt | Random | 0.6189476213030292 |
| 11 | Squared\_error | Log2 | best | 0.5474030540034933 |
| 12 | Squared\_error | Log2 | Random | 0.6919105628766614 |
| 13 | absolute\_error | None | best | 0.6733644045278622 |
| 14 | absolute\_error | None | Random | 0.7057318389099367 |
| 15 | absolute\_error | Sqrt | best | 0.6767432984478083 |
| 16 | absolute\_error | Sqrt | Random | 0.6988029657239385 |
| 17 | absolute\_error | Log2 | best | 0.7379762909674684 |
| 18 | absolute\_error | Log2 | Random | 0.7209126220377945 |
| 19 | Poisson | None | Best | 0.7249271535877528 |
| 20 | Poisson | None | Random | 0.7001604588289719 |
| 21 | Poisson | Sqrt | Best | 0.5719081259369333 |
| 22 | Poisson | Sqrt | Random | 0.6894709930843317 |
| 23 | Poisson | Log2 | Best | 0.7517515280277343 |
| 24 | Poisson | Log2 | Random | 0.6113962161770223 |

**RANDOM FOREST:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.NO** | **CRITERION** | **MAX\_FEATURES** | **n\_ESTIMATORS** | **R VALUE** |
| 1 | friedman\_mse | None | 10 | 0.8331662678473348 |
| 2 | friedman\_mse | None | 100 | 0.8540518935149612 |
| 3 | friedman\_mse | sqrt | 10 | 0.8502777994291519 |
| 4 | friedman\_mse | Sqrt | 100 | 0.8710544015500664 |
| 6 | friedman\_mse | Log2 | 10 | 0.8502777994291519 |
|  | friedman\_mse | Log2 | 100 | 0.8710544015500664 |
| 7 | Squared error | None | 10 | 0.83303041340085 |
| 8 | Squared error | None | 100 | 0.8538307913484513 |
| 10 | Squared\_error | Sqrt | 10 | 0.8520006346682765 |
| 11 | Squared\_error | Sqrt | 100 | 0.8710271903471005 |
| 12 | Squared\_error | Log2 | 10 | 0.8520006346682765 |
|  | Squared\_error | Log2 | 100 | 0.8710271903471005 |
| 13 | absolute\_error | None | 10 | 0.835063555313752 |
| 14 | absolute\_error | None | 100 | 0.8520093621081837 |
| 15 | absolute\_error | Sqrt | 10 | 0.8574290080917196 |
| 16 | absolute\_error | Sqrt | 100 | 0.8710685856341518 |
| 17 | absolute\_error | Log2 | 10 | 0.8574290080917196 |
| 18 | absolute\_error | Log2 | 100 | 0.8710685856341518 |
| 19 | Poisson | None | 10 | 0.8313991040134341 |
| 20 | Poisson | None | 100 | 0.8526334258892607 |
| 21 | Poisson | Sqrt | 10 | 0.8544955286235119 |
| 22 | Poisson | Sqrt | 100 | 0.8680156984764337 |
| 23 | Poisson | Log2 | 10 | 0.8544955286235119 |
| 24 | Poisson | Log2 | 100 | 0.8680156984764337 |