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| --- | --- | --- | --- | --- | --- |
| **To find the following the Machine Learning Regression method using in r2 value** | | | | | |
| **1. MULTIPLE LINEAR REGRESSION (R2 value) – 0.7894790349867009** | | | | | |
| **2. SUPPORT VECTOR MACHINE:** | | | | | |
| **SL.No** | **HYPER PARAMETER** | **LINEAR ( R VALUE)** | **RBF (NON LINEAR) (R VALUE)** | **POLY (R VALUE)** | **SIGMOID**  **(R VALUE)** |
| 1 | C10 | 0.462468 | -0.032273 | 0.038716 | 0.039307 |
| 2 | C100 | 0.628879 | 0.320031 | 0.617956 | 0.527610 |
| 3 | C500 | 0.763105 | 0.664298 | 0.826368 | 0.444606 |
| 4 | C1000 | 0.76493 | 0.810206 | 0.856648 | 0.287470 |
| 5 | C2000 | 0.744041 | 0.854776 | 0.860557 | -0.593950 |
| 6 | C3000 | 0.741423 | 0.866339 | 0.859893 | -2.124419 |
|  |  |  |  |  |  |
| **The SVM regression use R2 value = 0.866339 (Hyper Parameter=C3000, RBF)** | | | | | |
|  |  |  |  |  |  |
| **3. DECISION TREE** | | | | |  |
| **SL.No** | **CRITERION** | **SPLITTER** | **MAX FEATURE** | **R VALUE** |  |
| 1 | mse | best | auto | 0.722491 |  |
| 2 | mse | random | auto | 0.731888 |  |
| 3 | mse | best | sqrt | 0.663681 |  |
| 4 | mse | random | sqrt | 0.657844 |  |
| 5 | mse | best | Log2 | 0.757402 |  |
| 6 | mse | random | Log2 | 0.669587 |  |
| 7 | mae | best | auto | 0.645851 |  |
| 8 | mae | random | auto | 0.724042 |  |
| 9 | mae | best | sqrt | 0.684479 |  |
| 10 | mae | random | sqrt | 0.669290 |  |
| 11 | mae | best | Log2 | 0.676815 |  |
| 12 | mae | random | Log2 | 0.755443 |  |
| 13 | friedman\_mse | best | Auto | 0.697842 |  |
| 14 | friedman\_mse | random | Auto | 0.721841 |  |
| 15 | friedman\_mse | best | sqrt | 0.727048 |  |
| 16 | friedman\_mse | random | sqrt | 0.531729 |  |
| 17 | friedman\_mse | best | Log2 | 0.684132 |  |
| 18 | friedman\_mse | random | Log2 | 0.525491 |  |
|  |  |  |  |  |  |
| **The Decision Tree Regression use R2 value=0.757402(Criterion=’mse', Splitter='best', max feature='log2'** | | | | |  |

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| --- | --- | --- | --- | --- | --- |
| **4. RANDOM FOREST** | | | | |  |
| **SL.No** | **criterion** | **max\_features** | **n\_estimators** | **R VALUE** |  |
| 1 | mse | auto | 10 | 0.841327 |  |
| 2 | mse | auto | 100 | 0.855390 |  |
| 3 | mse | sqrt | 10 | 0.856701 |  |
| 4 | mse | sqrt | 100 | 0.871425 |  |
| 5 | mse | Log2 | 10 | 0.851085 |  |
| 6 | mse | Log2 | 100 | 0.869977 |  |
| 7 | mae | auto | 10 | 0.844544 |  |
| 8 | mae | auto | 100 | 0.854387 |  |
| 9 | mae | sqrt | 10 | 0.851612 |  |
| 10 | mae | sqrt | 100 | 0.874169 |  |
| 11 | mae | Log2 | 10 | 0.855869 |  |
| 12 | mae | Log2 | 100 | 0.872500 |  |
|  |  |  |  |  |  |
| **The Random Forest Regression use R2 value=0.874169 (Criterion=’mae', max\_features ='sqrt', n\_estimators =100** | | | | |  |
|  | | | | |  |

**The final Machine Learning best method of Regression:**

1. The SVM regression use R2 value = 0.866339 (Hyper Parameter=C3000, RBF)
2. The Random Forest Regression use R2 value=0.874169 (Criterion=’mae', max\_features ='sqrt', n\_estimators =100