**To find the following machine learning regression method using r^2 value**

1. **MULTIPLE LINEAR REGRESSION:**

**R^2 value =** 0.935

1. **SUPPORT VECTOR MACHINE:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SL. NO** | **HYPER  PARAMETER** | **LINEAR  (r value)** | **RBF (NON LINEAR) (r value)** | **POLY (r value)** | **SIGMOID (r value)** |
| 1 | C10 | -0.039644947 | -0.056807593 | -0.053667205 | -0.054719583 |
| 2 | C100 | 0.106468196 | -0.050726023 | -0.019802139 | -0.030453515 |
| 3 | C500 | 0.592897727 | -0.024323348 | 0.114684807 | 0.070572145 |
| 4 | C1000 | 0.780283988 | 0.006768344 | 0.266163709 | 0.18506862 |
| 5 | C2000 | 0.876772169 | 0.067515543 | 0.481002816 | 0.397065287 |
| 6 | C3000 | 0.895674469 | 0.123227566 | 0.63700642 | 0.591363021 |

SVM Regression best model from Linear and Hyper parameter (C=3000) **R^2 value** = 0.895

1. **DECISION TREE:**

|  |  |  |  |
| --- | --- | --- | --- |
| **SL. NO** | **CRITERION** | **SPLITTER** | **R VALUE** |
| 1 | squared\_error | best | 0.908316699 |
| 2 | squared\_error | random | 0.937352199 |
| 3 | friedman\_mse | best | 0.926004364 |
| 4 | friedman\_mse | random | 0.861108577 |
| 5 | absolute\_error | best | 0.95664675 |
| 6 | absolute\_error | random | 0.9288036 |
| 7 | poisson | best | 0.9203655 |
| 8 | poisson | random | 0.710068909 |

Decision Tree Regression best model from CRITRERION “absolute\_error” and SPLITTER “best” **R^2 value** = 0.956

1. **RANDOM FOREST:**

|  |  |  |  |
| --- | --- | --- | --- |
| **SL.No** | **n\_estimators** | **Random\_State** | **R Value** |
| 1 | 1 | 0 | 0.964514891 |
| 2 | 10 | 0 | 0.925277279 |
| 3 | 50 | 0 | 0.944633639 |
| 4 | 100 | 0 | 0.946004355 |

Random Forest Regression best model **R^2 value** = 0.964