To find following the machine learning regression method using in r2 value

**1.DecisionTreeRegressor :**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.no** | **Criterion** | **Max Features** | **Splitter** | **R2\_Value** |
| 1 | friedman\_mse | Sqrt | best | 0.7172 |
| 2 | friedman\_mse | sqrt | random | 0.6522 |
| 3 | friedman\_mse | Log2 | best | 0.6563 |
| 4 | friedman\_mse | Log2 | random | 0.6825 |
| 5 | friedman\_mse | none | best | 0.6943 |
| 6 | friedman\_mse | none | random | 0.6674 |
| 7 | squared\_error | sqrt | best | 0.7431 |
| 8 | squared\_error | sqrt | random | 0.6793 |
| 9 | squared\_error | Log2 | best | 0.7357 |
| 10 | squared\_error | Log2 | random | 0.7691 |
| 11 | squared\_error | none | best | 0.7241 |
| 12 | squared\_error | none | random | 0.6217 |
| 13 | absolute\_error | sqrt | best | 0.6518 |
| 14 | absolute\_error | sqrt | random | 0.6181 |
| 15 | absolute\_error | Log2 | best | 0.7049 |
| 16 | absolute\_error | Log2 | random | 0.7520 |
| 17 | absolute\_error | none | best | 0.6725 |
| 18 | absolute\_error | none | random | 0.6486 |
| 19 | Poisson | sqrt | best | 0.6850 |
| 20 | Poisson | sqrt | random | 0.7147 |
| 21 | Poisson | Log2 | best | 0.6854 |
| 22 | Poisson | Log2 | random | 0.6791 |
| 23 | Poisson | none | best | 0.7164 |
| 24 | Poisson | none | random | 0.6799 |

The **DecisionTreeRegressor R2\_Value** by using following hyper parameters

**Criterion** : absolute\_error , **Max Features** : log2 ,**Splitter** : random ,**R2\_Value :0.7520 .**

**2.Support Vector Regression :**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.no** | **Hyper**  **parameters** | **Linear**  **(r2\_value)** | **RBF - non linear**  **(r2\_value)** | **Poly**  **(r2\_value)** | **Sigmoid**  **(r2\_value)** |
| 1 | C=10 | -0.0016 | -0.0819 | -0.0931 | -0.0907 |
| 2 | C=100 | 0.5432 | -0.1248 | -0.0997 | -0.1181 |
| 3 | C=500 | 0.6270 | -0.1246 | -0.0820 | -0.4562 |
| 4 | C=1000 | 0.6340 | -0.1174 | -0.0555 | -1.6659 |
| 5 | C=2000 | 0.6893 | -0.1077 | -0.0027 | -5.6164 |
| 6 | C=3000 | 0.7590 | -0.0962 | 0.0489 | -12.0190 |

The **Support Vector Regression R2\_Value** by using following hyper parameters

**C= 3000, kernel = ,r2\_value= 0.7590.**

**3.RandomForest R2\_Value :**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.no** | **n\_estimators** | **Criterion** | **Max\_features** | **R2\_Value** |
| 1 | 50 | squared\_error | Sqrt | 0.8684 |
| 2 | 100 | squared\_error | sqrt | 0.8711 |
| 3 | 50 | squared\_error | Log2 | 0.8673 |
| 4 | 100 | squared\_error | Log2 | 0.8702 |
| 5 | 50 | squared\_error | None | 0.8559 |
| 6 | 100 | squared\_error | None | 0.8550 |
| 7 | 50 | absolute\_error | Sqrt | 0.8690 |
| 8 | 100 | absolute\_error | sqrt | 0.8705 |
| 9 | 50 | absolute\_error | Log2 | 0.8681 |
| 10 | 100 | absolute\_error | Log2 | 0.8726 |
| 11 | 50 | absolute\_error | None | 0.8521 |
| 12 | 100 | absolute\_error | None | 0.8566 |
| 13 | 50 | friedman\_mse | Sqrt | 0.8681 |
| 14 | 100 | friedman\_mse | sqrt | 0.8687 |
| 15 | 50 | friedman\_mse | Log2 | 0.8693 |
| 16 | 100 | friedman\_mse | Log2 | 0.8683 |
| 17 | 50 | friedman\_mse | None | 0.8544 |
| 18 | 100 | friedman\_mse | None | 0.8509 |
| 19 | 50 | poisson | Sqrt | 0.8680 |
| 20 | 100 | poisson | sqrt | 0.8721 |
| 21 | 50 | poisson | Log2 | 0.8686 |
| 22 | 100 | poisson | Log2 | 0.8718 |
| 23 | 50 | poisson | None | 0.8522 |
| 24 | 100 | poisson | None | 0.8550 |

The **RandomForestRegression r2\_value = 0.8726**  by using hyper parameters are following

**N\_estimators** =100 ,**criterion** = absolute\_error,**max\_features**=log2 .