Date: Aug 5th 2025

**To fine the best Model – Machine learning Regression method**

1. **Multiple Linear Regression** –

R Score: 0.93

1. **Support Vector Machine:** 
   * 1. Linear : In put data without standardization

R Score : 0.875334

* + 1. RBF: In put data without standardization
       1. -0.12541

**SVM with standardization**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S No** | **Hyper Parameter**  **( C )** | **LINEAR (r Value)** | **RBF(Non Linear Value)** | **POLY (r value)** | **SIGMOID (R value)** |
| 1 | 0.01 | -0.1257 | -0.1257 | -0.1257 | -0.1257 |
| 2 | 0.10 | -0.1257 | -0.12577 | -0.12574 | -0.1257 |
| 3 | 10.0 | -0.1068 | 0.12528 | -0.1215 | -0.1228 |
| 4 | 100 | 0.0430 | -0.1208 | -0.08424 | -0.09643 |
| 5 | 500 | 0.5352 | 0.10145 | 0.0718 | 0.0064 |
| 6 | 5000 | 0.8800 | 0.07266 | 0.81638 | 0.7185 |

1. **Decision Tree**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S No** | **Criterion** | **MAX\_Feature** | **SPLITTERR\_VALUE** | **R\_VALUE** |
| 1 | Squared\_error | None | best | 0.89 |
| 2 | friedman\_mse | 2 | best | 0.57 |
| 3 | Absolute\_error | none | best | 0.92 |
| 4 | poision | none | best | 0.912 |
| 5 | Squared\_error | none | random | 0.7292 |
| 6 | friedman\_mse | 2 | random | 0.44 |
| 7 | Absolute\_error | none | random | 0.911 |
| 8 | poision | none | random | 0.86 |
|  |  |  |  |  |

1. **Random Forest:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S No** | **Criterion** | **MAX\_Feature** | **N\_Estimation** | **R\_VALUE** |
| 1 | *squared\_error* | 1.0 | 50 | 0.91373 |
| 2 | squared\_error | 1.0 | 100 | 0.9191 |
| 3 | squared\_error | 1.0 | 500 | 0.9277 |
| 4 | absolute\_error | 1.0 | 50 | 0.9231 |
| 5 | absolute\_error | 1.0 | 100 | 0.9264 |
| 6 | absolute\_error | 1.0 | 500 | 0.9295 |
| 7 | friedman\_mse | 1.0 | 50 | 0.91486 |
| 8 | friedman\_mse | 1.0 | 100 | 0.9238 |
| 9 | friedman\_mse | 1.0 | 500 | 0.9289 |