**Find The Following Machine Learning Regression Method using r2 value**

**1.Multiple Linear Regression (R2value):**

**r2=0.93**

**2.Support Vector Machine:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.no** | **Hyper parameter** | **Linear**  **(r2 value)** | **RbF(non-linear)**  **(r2 value)** | **Sigmoid**  **(r2 value)** | **Poly**  **(r2 value)** |
| **1** | **C=1.0** | 0.8753 | -0.12541 | -0.125814 | -0.11540 |
| **2** | **C=100** | -74.975 | -0.107626 | -0.12884 | 0.4143 |
| **3** | **C=10.50** | 0.17361 | -0.12191 | -0.12610 | -0.05497 |
| **4** | **C=50** | -17.23592 | -0.11454 | -0.12731 | 0.15547 |
| **5** | **C=500.50** | 0.78222  **C=1.30** | -0.0077 | -0.141270 | 0.64344 |
| **6** | **C=1000** | **-**-5.29680  **C=30** | 0.04095 | -0.15710 | 0.667156 |

**The SVMRegression use linear and hyper parameter c=1.0**

**(r2 value)=0.8753.**

**3.Decision Tree :**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.no** | **Criterion** | **Max Features** | **Splitter** | **R2 Value** |
| 1 | squared\_error | auto | best | 0.89539 |
| **2** | squared\_error | sqrt | best | 0.38075 |
| **3** | squared\_error | log2 | best | -0.07895 |
| **4** | squared\_error | auto | random | -0.07895 |
| **5** | squared\_error | sqrt | random | 0.60562 |
| **6** | squared\_error | log2 | random | 0.40984 |
| **7** | *friedman\_mse* | **auto** | **best** | 0.888891 |
| **8** | *friedman\_mse* | **sqrt** | **best** | 0.94144 |
| **9** | *friedman\_mse* | **log2** | **best** | 0.86739 |
| **10** | *friedman\_mse* | **auto** | **random** | 0.78918 |
| **11** | *friedman\_mse* | **sqrt** | **random** | 0.290249 |
| **12** | *friedman\_mse* | **log2** | **random** | 0.7953 |
| **13** | *absolute\_error* | **Auto** | **best** | 0.93717 |
| **14** | *absolute\_error* | **sqrt** | **best** | 0.81108 |
| **15** | *absolute\_error* | **log2** | **best** | -0.37118 |
| **16** | *absolute\_error* | **Auto** | **Random** | 0.94140 |
| **17** | *absolute\_error* | **Sqrt** | **Random** | 0.62488 |
| **18** | *absolute\_error* | **Log2** | **Random** | -0.13941 |
| **19** | *poisson* | **Auto** | **best** | 0.6871 |
| **20** | ***poisson*** | **Sqrt** | **Best** | 0.60934 |
| **21** | ***poisson*** | **Log2** | **Best** | 0.21271 |
| **22** | ***Poisson*** | **Auto** | **Random** | 0.7196 |
| **23** | ***Poisson*** | **Sqrt** | **Random** | -0.6582 |
| **24** | ***poisson*** | **Auto** | **Random** | -0.2389 |

**.In this decision tree regression use friedman\_mse hyper parameter under max feature is sqrt and splitter is best model ( r2value)=** 0.94144