MACHINE LEARNING REGRESSION

To choose the best model by using the r2\_score:

**1.Multiple Linear Regression:**

* R2\_score=0.9358680970046243

**2.Support Vector Machine:**

* Rbf is default

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| S.no | Hyper Tuning | Linear(R2\_score) | rbf(R2\_score) | poly(R2\_score) | Sigmoid(R2\_score) |
| 1 | c=100 | 0.043028787 | -0.12082928 | -0.084249375 | 0.096439826 |
| 2 | c=500 | 0.535229437 | -0.10145561 | 0.071812167 | 0.006463608 |
| 3 | c=1000 | 0.79425551 | -0.08004178 | 0.211291913 | 0.137658198 |
| 5 | c=2000 | 0.870256677 | -0.03059805 | 0.492081759 | 0.360713879 |
| 7 | c=3000 | 0.858411383 | 0.042801194 | 0.66031713 | 0.498686412 |

* Best performance in SVM: c=2000,Kernel’Linear’=0.870256677

**3.Decision Tree:**

* **criterion{“squared\_error”, “friedman\_mse”, “absolute\_error”, “poisson”}, default=”squared\_error”**
* **splitter{“best”, “random”}, default=”best”**
* **max\_featuresint, float or {“sqrt”, “log2”}, default=None**

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| --- | --- | --- | --- | --- |
| s.no | criterion | splitter | Max\_Feautures | R2\_score |
| 1 | Squared\_error | best | None | 0.9085881953864989 |
| 2 | Squared\_error | best | sqrt | 0.48252137800112094 |
| 3 | Squared\_error | best | Log2 | 0.17471244946184628 |
| 4 | Squared\_error | random | None | 0.8697004693717081 |
| 5 | Squared\_error | random | Sqrt | 0.6951262130100012 |
| 6 | Squared\_error | random | Log2 | 0.8448521256904908 |
| 7 | friedman\_mse | Best | None | 0.8904635630409867 |
| 8 | friedman\_mse | Best | sqrt | 0.7369463303744204 |
| 9 | friedman\_mse | Best | Log2 | 0.8595508429335939 |
| 10 | friedman\_mse | Random | None | 0.8945219024706266 |
| 11 | friedman\_mse | Random | sqrt | 0.31909128664997577 |
| 12 | friedman\_mse | Random | Log2 | 0.1420538772089165 |
| 13 | absolute\_error | Best | None | 0.9240060009221149 |
| 14 | absolute\_error | Best | sqrt | 0.5121071581299432 |
| 15 | absolute\_error | Best | Log2 | 0.4284828482190408 |
| 16 | absolute\_error | Random | None | 0.5386850235643375 |
| 17 | absolute\_error | Random | sqrt | 0.74243455380437 |
| 18 | absolute\_error | Random | Log2 | 0.4783879518471468 |
| 19 | poisson | Best | None | 0.9079227197195913 |
| 20 | poisson | Best | sqrt | 0.7891426436334648 |
| 21 | poisson | Best | Log2 | 0.0780355580756612 |
| 22 | poisson | Random | None | 0.7014273266999087 |
| 23 | poisson | Random | sqrt | 0.4201379490471914 |
| 24 | poisson | Random | Log2 | 0.8931260066418572 |

* Best Performance:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s.no | criterion | splitter | Max\_Feautures | R2\_score |
| 13 | absolute\_error | Best | None | 0.9240060009221149 |