Different Machine learning Regression methods to find r2 values

1. Simple Linear Regression:

R2 Value: 0.7894790

1. Multiple Linear Regression:

R2 Value: 0.789479

1. Support Vector Machine:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.NO | Hyper Parameter | R2 Value | | | |
| Linear | RBF | Poly | Sigmoid |
| 1 | C10 | 0.462468 | -0.03227 | 0.038712 | 0.039307 |
| 2 | C100 | 0.628879 | 0.320031 | 0.617956 | 0.527610 |
| 3 | C500 | 0.763105 | 0.664298 | 0.826368 | 0.444606 |
| 4 | C1000 | 0.764931 | 0.81020 | 0.856648 | 0.287470 |
| 5 | C2000 | 0.744041 | 0.854776 | 0.860557 | -0.593950 |
| 6 | C3000 | 0.741423 | 0.866339 | 0.85989 | -2.124419 |

In SVM regression R2 value is best for kernel rbf= (C=3000): 0.866339

1. Decision Tree:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***SL.NO*** | ***CRITERION*** | ***MAX\_FEATURES*** | ***SPLITTER*** | ***R2 VALUE*** |
| 1 | squared\_error | sqrt | best | 0.69863 |
| 2 | squared\_error | log2 | best | 0.67876 |
| 3 | squared\_error | auto | best | 0.711146 |
| 4 | squared\_error | sqrt | random | 0.686511 |
| 5 | squared\_error | log2 | random | 0.636321 |
| 6 | squared\_error | auto | random | 0.731595 |
| 7 | friedman\_mse | sqrt | best | 0.72192 |
| 8 | friedman\_mse | log2 | best | 0.689316 |
| 9 | friedman\_mse | auto | best | 0.701356 |
| 10 | friedman\_mse | sqrt | random | 0.612828 |
| 11 | friedman\_mse | log2 | random | 0.712738 |
| 12 | friedman\_mse | auto | random | 0.63708 |
| 13 | absolute\_error | sqrt | best | 0.613460 |
| 14 | absolute\_error | log2 | best | 0.706617 |
| 15 | absolute\_error | auto | best | 0.68993 |
| 16 | absolute\_error | sqrt | random | 0.74532 |
| 17 | absolute\_error | log2 | random | 0.620209 |
| 18 | absolute\_error | auto | random | 0.73288 |
| 19 | poisson | sqrt | best | 0.738786 |
| 20 | poisson | log2 | best | 0.740729 |
| 21 | poisson | auto | best | 0.728731 |
| 22 | poisson | sqrt | random | 0.637090 |
| 23 | poisson | log2 | random | 0.705015 |
| 24 | poisson | auto | random | 0.730891 |

In Decision tree regression R2 value is best for CRITERION= absolute\_error, MAX\_FEATURES=sqrt, SPLITTER= random: 0.74532

1. RandomForestRegressor

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***SL.NO*** | ***CRITERION*** | ***MAX\_FEATURES*** | ***n\_estimators*** | ***R2 VALUE*** |
| 1 | squared\_error | sqrt | 50 | 0.86808 |
| 2 | squared\_error | log2 | 50 | 0.86807 |
| 3 | squared\_error | auto | 50 | 0.85671 |
| 4 | squared\_error | sqrt | 100 | 0.872270 |
| 5 | squared\_error | log2 | 100 | 0.873169 |
| 6 | squared\_error | auto | 100 | 0.858568 |
| 7 | friedman\_mse | sqrt | 50 | 0.868586 |
| 8 | friedman\_mse | log2 | 50 | 0.869634 |
| 9 | friedman\_mse | auto | 50 | 0.858075 |
| 10 | friedman\_mse | sqrt | 100 | 0.866332 |
| 11 | friedman\_mse | log2 | 100 | 0.874293 |
| 12 | friedman\_mse | auto | 100 | 0.851027 |
| 13 | absolute\_error | sqrt | 50 | 0.87181 |
| 14 | absolute\_error | log2 | 50 | 0.875875 |
| 15 | absolute\_error | auto | 50 | 0.856974 |
| 16 | absolute\_error | sqrt | 100 | 0.874715 |
| 17 | absolute\_error | log2 | 100 | 0.874195 |
| 18 | absolute\_error | auto | 100 | 0.857207 |
| 19 | poisson | sqrt | 50 | 0.870596 |
| 20 | poisson | log2 | 50 | 0.87148 |
| 21 | poisson | auto | 50 | 0.856465 |
| 22 | poisson | sqrt | 100 | 0.871586 |
| 23 | poisson | log2 | 100 | 0.868924 |
| 24 | poisson | auto | 100 | 0.851993 |

In RandomForest Regressor, R2 value is best for CRITERION= absolute\_error, MAX\_FEATURES=log2, n\_estimators= 50: 0.875875

Best R2 value comes from RandomForest Regressor, R2 value is best for CRITERION= absolute\_error, MAX\_FEATURES=log2, n\_estimators= 50: 0.875875