The following to machine learning regression to find R2 value

1.Multiple Linear Regression- R2=0.9358

2. Support Vector Machine(SVM):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.NO | STANDRDISATION | HYPER  PARAMETER | LINEAR  (R2 VALUE) | RBF(NON-  LINEAR)  (R2 VALUE) | POLY  (R2 VALUE) | SIGMOID  (R2 VALUE) |
| 1 | Not use | Not use | 0.8950 | -0.0574 |  | 0.0574 |
| 2 | Not use | C=0.01 | 0.9335 | -0.0574 |  | 0.0574 |
| 3 | Not use | C=0.10 | 0.9375 | -0.0574 |  | 0.0574 |
| 4 | Not use | C=0.20 | 0.9348 | -0.0574 |  | 0.0574 |
| 5 | Not use | C=0.100 | 0.9375 | -0.0574 |  | 0.0574 |
| 6 | Not use | C=1 | 0.8950 | -0.0574 | *It’s take more time* | 0.0574 |
| 7 | Not use | C=10 | -2.4372 | -0.0574 |  | 0.0574 |
| 8 | Not use | C=100 | -357.0705 | -0.0574 |  | -0.0572 |
| 9 | Use | Not use | -0.0556 | -0.0574 | -0.0571 | -0.0572 |
| 10 | Use | C=0.01 | -0.0574 | -0.0574 | -0.0571 | -0.0572 |
| 11 | Use | C=0.10 | -0.0573 | -0.0574 | -0.0571 | -0.0572 |
| 12 | Use | C=0.100 | -0.0573 | -0.0574 | -0.0571 | -0.0572 |
| 13 | Use | C=1 | -.0.0556 | -0.0574 | -0.0571 | -0.0572 |
| 14 | Use | C=10 | -0.0396 | -0.0568 | -0.0571 | -0.0304 |
| 15 | Use | C=100 | 0.1064 | -0.0507 | -0.0571 | -0.0304 |
| 16 | Use | C=1000 | 0.7802 | 0.0067 | -0.0571 | 0.1850 |

* ***The SVM method doesn’t use satandarstiond but using hyper paremeter C =0.10 compare to multiple linear regression same to R2 value.***

***3.Decision Tree:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *S.NO* | CRITERION | MORE FEATURES | SPLITTEER | R2 VALUE |
| 1 | ***Friedman\_mse*** | ***auto*** | ***best*** | ***0.9193*** |
| ***2*** | ***Friedman\_mse*** | ***sqrt*** | ***best*** | ***0.7170*** |
| ***3*** | ***Friedman\_mse*** | ***Log2*** | ***best*** | ***0,8813*** |
| ***4*** | ***Friedman\_mse*** | ***auto*** | ***random*** | ***0.9443*** |
| ***5*** | ***Friedman\_mse*** | ***sqrt*** | ***random*** | ***-0.2037*** |
| ***6*** | ***Friedman\_mse*** | ***Log2*** | ***random*** | ***0.1483*** |
| ***7*** | ***Mae*** | ***auto*** | ***best*** | ***0.9427*** |
| ***8*** | ***Mae*** | ***sqrt*** | ***best*** | ***0.5998*** |
| ***9*** | ***Mae*** | ***Log2*** | ***best*** | ***0.6981*** |
| ***10*** | ***Mae*** | ***auto*** | ***random*** | ***0.8683*** |
| ***11*** | ***Mae*** | ***sqrt*** | ***random*** | ***0.4724*** |
| ***12*** | ***Mae*** | ***Log2*** | ***random*** | ***0.4566*** |
| ***13*** | ***Mse*** | ***auto*** | ***best*** | ***0/9130*** |
| ***14*** | ***Mse*** | ***sqrt*** | ***best*** | ***-0.4609*** |
| ***15*** | ***Mse*** | ***Log2*** | ***best*** | ***0.4526*** |
| ***16*** | ***Mse*** | ***auto*** | ***random*** | ***0.8185*** |
| ***17*** | ***Mse*** | ***sqrt*** | ***random*** | ***0.3104*** |
| ***18*** | ***mse*** | ***Log2*** | ***random*** | ***-0.267*** |

* ***The best model of Decision Tree compare to Multiple Linear Regression and SVM.***

***(*** CRITERION= ***“Mae”,*** MORE FEATURES=”auto”, SPLITTEER=”best”)R2 value=0.9427

***4.Random Forest:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *S.NO* | *N\_ESTIMATORS* | *CRITERION* | *MAX\_FEATURE* | *R2 VALUE* |
| ***1*** | ***10*** | ***Mae*** | ***auto*** | ***0.9250*** |
| ***2*** | ***50*** | ***Mae*** | ***auto*** | ***0.9467*** |
| ***3*** | ***100*** | ***Mae*** | ***auto*** | ***0.9389*** |
| ***4*** | ***1000*** | ***Mae*** | ***Auto*** | ***0.9412*** |
| ***5*** | ***10*** | ***Mae*** | ***Sqrt*** | ***0.8576*** |
| ***6*** | ***50*** | ***Mae*** | ***Sqrt*** | ***0.8535*** |
| ***7*** | ***100*** | ***Mae*** | ***Sqrt*** | ***0.7739*** |
| ***8*** | ***1000*** | ***Mae*** | ***Sqrt*** | ***0.8140*** |
| ***9*** | ***10*** | ***Mae*** | ***log2*** | ***0.6666*** |
| ***10*** | ***50*** | ***Mae*** | ***log2*** | ***0.8595*** |
| ***11*** | ***100*** | ***Mae*** | ***log2*** | ***0.7911*** |
| ***12*** | ***1000*** | ***Mae*** | ***log2*** | ***0.8105*** |
| ***13*** | ***10*** | ***mse*** | ***auto*** | ***0.9276*** |
| ***14*** | ***50*** | ***Mse*** | ***auto*** | ***0.9390*** |
| ***15*** | ***100*** | ***Mse*** | ***auto*** | ***0.9378*** |
| ***16*** | ***1000*** | ***Mse*** | ***Auto*** | ***0.9386*** |
| ***17*** | ***10*** | ***Mse*** | ***Sqrt*** | ***0.5898*** |
| ***18*** | ***50*** | ***Mse*** | ***Sqrt*** | ***0.7629*** |
| ***19*** | ***100*** | ***Mse*** | ***Sqrt*** | ***0.7955*** |
| ***20*** | ***1000*** | ***mse*** | ***Sqrt*** | ***0.81486*** |
| ***21*** | ***10*** | ***Mse*** | ***log2*** | ***0.7869*** |
| ***22*** | ***50*** | ***Mse*** | ***log2*** | ***0.7579*** |
| ***23*** | ***100*** | ***Mse*** | ***log2*** | ***0.8399*** |
| ***24*** | ***1000*** | ***mse*** | ***log2*** | ***0.8165*** |

* ***The random forest compare to decision tree to same model.***

***(n\_estimators=50,criterion=mae,max\_feature=auto,R2 value=0.9467***