**Since there are multiple inputs and output are known. it is a supervised and the output in numerical so Supervised Linear Regression.  
1. Multiple Linear Regression (R2 value)= 0.7894**

**2. Support Vector Machine: Only Linear: -0.1116**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.No | Hyper Parameter | Linear | RBF | Poly | Sigmoid | Precomputed |
| 1 | C=10 | 0.4624 | -0.03227 | 0.0387 | 0.0393 | Not working |
| 2 | C=100 | 0.6288 | 0.3200 | 0.6179 | 0.5276 | Not working |
| 3 | C=500 | 0.7631 | 0.6642 | 0.8263 | 0.4446 | Not working |
| 4 | C=1000 | 0.7649 | 0.8102 | 0.8566 | 0.2874 | Not working |
| 5 | C=2000 | 0.7440 | 0.8547 | 0.8605 | -0.5939 | Not working |
| 6 | C=5000 | 0.7414 | 0.8747 | 0.8595 | -7.5300 | Not working |

For c=5000 only in Rbf the R2 value is 0.8747 nearly to 1.

**3. Decision Tree**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.No | **criterion** | **splitter** | **max\_features** | **R.Value** |
| 1 | ***squared\_error*** | ***best*** | ***auto*** | 0.7051 |
| 2 | ***squared\_error*** | ***best*** | ***sqrt*** | 0.6665 |
| 3 | ***squared\_error*** | ***best*** | ***log2*** | 0.5579 |
| 4 | ***squared\_error*** | ***random*** | ***auto*** | 0.7367 |
| 5 | ***squared\_error*** | ***random*** | ***sqrt*** | 0.6132 |
| 6 | ***squared\_error*** | ***random*** | ***log2*** | 0.7026 |
| 7 | ***friedman\_mse*** | ***best*** | ***auto*** | 0.6861 |
| 8 | ***friedman\_mse*** | ***best*** | ***sqrt*** | 0.6912 |
| 9 | ***friedman\_mse*** | ***best*** | ***log2*** | 0.6939 |
| 10 | ***friedman\_mse*** | ***random*** | ***auto*** | 0.6958 |
| 11 | ***friedman\_mse*** | ***random*** | ***sqrt*** | 0.6481 |
| 12 | ***friedman\_mse*** | ***random*** | ***log2*** | 0.6271 |
| 13 | ***absolute\_error*** | ***best*** | ***auto*** | 0.6626 |
| 14 | ***absolute\_error*** | ***best*** | ***sqrt*** | 0.7542 |
| 15 | ***absolute\_error*** | ***best*** | ***log2*** | 0.7198 |
| 16 | ***absolute\_error*** | ***random*** | ***auto*** | 0.7616 |
| 17 | ***absolute\_error*** | ***random*** | ***sqrt*** | 0.7399 |
| 18 | ***absolute\_error*** | ***random*** | ***log2*** | 0.7245 |
| 19 | ***poisson*** | ***best*** | ***auto*** | 0.7485 |
| 20 | ***poisson*** | ***best*** | ***sqrt*** | 0.6175 |
| 21 | ***poisson*** | ***best*** | ***log2*** | 0.6964 |
| 22 | ***poisson*** | ***random*** | ***auto*** | 0.7076 |
| 23 | ***poisson*** | ***random*** | ***sqrt*** | 0.6552 |
| 24 | ***poisson*** | ***random*** | ***log2*** | 0.5519 |

**3. Random Forest:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.No | **criterion** | **max\_features** | **n\_estimators** | **R.Value** |
| 1 | ***squared\_error*** | ***sqrt*** | 10 | 0.8520 |
| 2 | ***squared\_error*** | ***sqrt*** | 50 | 0.8695 |
| 3 | ***squared\_error*** | ***sqrt*** | 100 | 0.8710 |
| 4 | ***squared\_error*** | ***log2*** | 10 | 0.8520 |
| 5 | ***squared\_error*** | ***log2*** | 50 | 0.8695 |
| 6 | ***squared\_error*** | ***log2*** | 100 | 0.8710 |
| 7 | ***squared\_error*** | ***none*** | 10 | Not working |
| 8 | ***squared\_error*** | ***none*** | 50 | Not working |
| 9 | ***squared\_error*** | ***none*** | 100 | Not working |
| 10 | ***squared\_error*** | ***int*** | 10 | Not working |
| 11 | ***squared\_error*** | ***int*** | 50 | Not working |
| 12 | ***squared\_error*** | ***int*** | 100 | Not working |
| 13 | ***squared\_error*** | ***float*** | 10 | Not working |
| 14 | ***squared\_error*** | ***float*** | 50 | Not working |
| 15 | ***squared\_error*** | ***float*** | 100 | Not working |
| 16 | ***squared\_error*** | ***default=1.0*** | 10 | Not working |
| 17 | ***squared\_error*** | ***default=1.0*** | 50 | Not working |
| 18 | ***squared\_error*** | ***default=1.0*** | 100 | Not working |
| 19 | ***absolute\_error*** | ***sqrt*** | 10 | 0.8574 |
| 20 | ***absolute\_error*** | ***sqrt*** | 50 | 0.8708 |
| 21 | ***absolute\_error*** | ***sqrt*** | 100 | 0.8710 |
| 22 | ***absolute\_error*** | ***log2*** | 10 | 0.8574 |
| 23 | ***absolute\_error*** | ***log2*** | 50 | 0.8708 |
| 24 | ***absolute\_error*** | ***log2*** | 100 | 0.8710 |
| 25 | ***absolute\_error*** | ***none*** | 10 | Not working |
| 26 | ***absolute\_error*** | ***none*** | 50 | Not working |
| 27 | ***absolute\_error*** | ***none*** | 100 | Not working |
| 28 | ***absolute\_error*** | ***int*** | 10 | Not working |
| 29 | ***absolute\_error*** | ***int*** | 50 | Not working |
| 30 | ***absolute\_error*** | ***int*** | 100 | Not working |
| 31 | ***absolute\_error*** | ***float*** | 10 | Not working |
| 32 | ***absolute\_error*** | ***float*** | 50 | Not working |
| 33 | ***absolute\_error*** | ***float*** | 100 | Not working |
| 34 | ***absolute\_error*** | ***default=1.0*** | 10 | Not working |
| 35 | ***absolute\_error*** | ***default=1.0*** | 50 | Not working |
| 36 | ***absolute\_error*** | ***default=1.0*** | 100 | Not working |
| 37 | ***friedman\_mse*** | ***sqrt*** | 10 | 0.8502 |
| 38 | ***friedman\_mse*** | ***sqrt*** | 50 | 0.8702 |
| 39 | ***friedman\_mse*** | ***sqrt*** | 100 | 0.8710 |
| 40 | ***friedman\_mse*** | ***log2*** | 10 | 0.8502 |
| 41 | ***friedman\_mse*** | ***log2*** | 50 | 0.8702 |
| 42 | ***friedman\_mse*** | ***log2*** | 100 | 0.8710 |
| 43 | ***friedman\_mse*** | ***none*** | 10 | Not working |
| 44 | ***friedman\_mse*** | ***none*** | 50 | Not working |
| 45 | ***friedman\_mse*** | ***none*** | 100 | Not working |
| 46 | ***friedman\_mse*** | ***int*** | 10 | Not working |
| 47 | ***friedman\_mse*** | ***int*** | 50 | Not working |
| 48 | ***friedman\_mse*** | ***int*** | 100 | Not working |
| 49 | ***friedman\_mse*** | ***float*** | 10 | Not working |
| 50 | ***friedman\_mse*** | ***float*** | 50 | Not working |
| 51 | ***friedman\_mse*** | ***float*** | 100 | Not working |
| 52 | ***friedman\_mse*** | ***default=1.0*** | 10 | Not working |
| 53 | ***friedman\_mse*** | ***default=1.0*** | 50 | Not working |
| 54 | ***friedman\_mse*** | ***default=1.0*** | 100 | Not working |
| 55 | ***poisson*** | ***sqrt*** | 10 | 0.8544 |
| 56 | ***poisson*** | ***sqrt*** | 50 | 0.8632 |
| 57 | ***poisson*** | ***sqrt*** | 100 | 0.8680 |
| 58 | ***poisson*** | ***log2*** | 10 | 0.8544 |
| 59 | ***poisson*** | ***log2*** | 50 | 0.8632 |
| 60 | ***poisson*** | ***log2*** | 100 | 0.8680 |
| 61 | ***poisson*** | ***none*** | 10 | Not working |
| 62 | ***poisson*** | ***none*** | 50 | Not working |
| 63 | ***poisson*** | ***none*** | 100 | Not working |
| 64 | ***poisson*** | ***int*** | 10 | Not working |
| 65 | ***poisson*** | ***int*** | 50 | Not working |
| 66 | ***poisson*** | ***int*** | 100 | Not working |
| 67 | ***poisson*** | ***float*** | 10 | Not working |
| 68 | ***poisson*** | ***float*** | 50 | Not working |
| 69 | ***poisson*** | ***float*** | 100 | Not working |
| 70 | ***poisson*** | ***default=1.0*** | 10 | Not working |
| 71 | ***poisson*** | ***default=1.0*** | 50 | Not working |
| 72 | ***poisson*** | ***default=1.0*** | 100 | Not working |

Checking will all Criterion and max features ( ***squared\_error, absolute\_error***

***sqrt 100 )*** and (***friedman\_mse sqrt 100)***

(R value is 0.8710)Saving this value aas a model since the model is the best model and value nearby to 1.