**R2\_score Value for insurance\_pre.csv file**

**Machine Learning (Regression)**

**HEERTHI RAJA H**

**ASSIGNMENT**

1. MULTIPLE LINEAR REGRESSION

R2\_score Value= 0.7894

1. SUPPORT VECTOR MACHINE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.NO | HYPER PARAMETER | LINEAR (r value) | RBF  (r value) | POLY  (rvalue) | SIGMOID (r value) |
| 1. | C10 | 0.367 | 0.053 | 0.051 | -0.001 |
| 2. | C100 | 0.583 | 0.243 | 0.510 | 0.470 |
| 3. | C1000 | 0.594 | 0.706 | 0.793 | 0.305 |
| 4. | C2000 | 0.620 | 0.781 | 0.805 | -0.441 |
| 5. | C3000 | 0.624 | 0.796 | 0.806 | -0.588 |

The SVM Regression use R2 Value(poly and parameter(c3000))= 0.8068

1. Decision Tree

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.NO | CRITERION | MAX FEATURES | SPLITTER | R2 VALUE |
| 1. | Mse | Auto | Best | 0.663 |
| 2. | Mse | Auto | Random | 0.668 |
| 3. | Mse | Sqrt | Best | 0.471 |
| 4. | Mse | Sqrt | Random | 0.499 |
| 5. | Mse | Log2 | Best | 0.643 |
| 6. | Mse | Log2 | Rsndom | 0.568 |
| 7. | Mae | Auto | Best | 0.636 |
| 8. | Mae | Auto | Random | 0.666 | |
| 9. | Mae | Sqrt | Best | 0.635 | |
| 10. | Mae | Sqrt | Random | 0.645 | |
| 11. | Mae | Log2 | Best | 0.604 | |
| 12. | mae | Log2 | Random | 0.650 | |
| 13. | Friedman\_mse | Auto | Best | 0.684 | |
| 14. | Friedman\_mse | Auto | Random | 0.653 | |
| 15. | Friedman\_mse | Sqrt | Best | 0.578 | |

The Decision Tree Regression use R2 value(friedman\_mse, max\_features, auto, best)= 0.6847

1. RANDOM FOREST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.NO | CRITERION | MAX FEATURES | N ESTIMATES | R2 SCORE VALUE |
| 1. | Mse | Auto | 100 | 0.8042 |
| 2. | Mse | Sqrt | 10 | 0.7939 |
| 3. | Mse | Sqrt | 100 | 0.8107 |
| 4. | Mse | Log2 | 10 | 0.7905 |
| 5. | Mse | Log2 | 100 | 0.8112 |
| 6. | Mae | Auto | 10 | 0.7815 |
| 7. | Mae | Auto | 100 | 0.7984 |
| 8. | Mae | Sqrt | 10 | 0.7985 |
| 9. | Mae | Sqrt | 100 | 0.8128 |
| 10. | Mae | Log2 | 10 | 0.7915 |
| 11. | Mae | Log2 | 100 | 0.8070 |

The Random Forest Regression

R2value (Mae, sqrt, 100)= 0.8128

The Final Machine Learning best method of Regression:

1. The SVM Regression use R2 Value(poly and parameter(c3000))= 0.8068

(or)

1. The Random Forest Regression R2value (Mae, sqrt, 100)= 0.8128

**Thank you!**