**Regression Assignment**

To calculate an insurance-related charge based on predefined values using an independently chosen machine learning method. Supervised learning with regression is employed, and a Random Forest algorithm is used to develop a good model, achieving an R-score of 0.855 (rounded)

**Random Forest**:

|  |  |
| --- | --- |
| **criterion** | **r\_score** |
| squared\_error | 0.854954529 |
| absolute\_error | 0.853186598 |
| friedman\_mse | 0.855143391 |
| poisson | 0.853588078 |

**Support Vector Machine**:

|  |  |
| --- | --- |
| **kernel** | **r\_score** |
| rbf |  |
| C=0.01 | -0.089645537 |
| C=0.10 | -0.089074515 |
| C=1.00 | -0.083382386 |
| C=10.00 | -0.032273294 |
| C=100.00 | 0.320031783 |
| C=1000.00 | 0.810206485 |
| C=3000.00 | 0.866339395 |
| Poly |  |
| C=10.00 | 0.038716223 |
| C=100.00 | 0.617956962 |
| C=1000.00 | 0.856648768 |
| C=2000.00 | 0.860557928 |
| C=3000.00 | 0.859893008 |
| Sigmoid |  |
| C=10.00 | 0.039307144 |
| C=100.00 | 0.527610355 |
| C=1000.00 | 0.287470695 |
| C=2000.00 | -0.593950973 |
| C=3000.00 | -2.124419479 |

**Multiple Linear Regression**:

|  |  |
| --- | --- |
| **r\_score** | 0.789479035 |

**Decision Tree**:

|  |  |  |
| --- | --- | --- |
| **Criterion** | **Splitter** | **r\_score value** |
| Squared\_error | best | 0.69071004 |
| Squared\_error | random | 0.68738147 |
| friedman\_mse | best | 0.7098666 |
| friedman\_mse | random | 0.71500549 |
| absolute\_error | best | 0.69256925 |
| absolute\_error | random | 0.78300497 |
| poisson | best | 0.71977999 |
| poisson | random | 0.70047105 |