Assignment 2 Report

Task 5

|  |  |  |
| --- | --- | --- |
|  | TIME | MSE |
| Piecewise Linear Regression | 7.14 | 2045.7 |
| Piecewise Polynomial Regression | 2.83 | 678.9 |
| Polynomial Regression | 0.001 | 25192.1 |

Task 7

Chart, line chart, histogram

Description automatically generatedChart, line chart

Description automatically generatedChart, line chart

Description automatically generated

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | X0 | X1 | X2 | X3 | X4 | X5 | X6 | R2 |
| Single Poly | 0 | -50 | 3.1 | -0.64 | 0.00064 | -0.000000306 | 0.000000001 | 0.94 |
| Lasso | 0 | 0 | 0 | 0.00196 | -0.000012 | -0.00000001 | 0 | 0.84 |
| Ridge | 0 | 0.014 | 0.61 | -0.0163 | 0.000203 | -0.00000115 | 0 | 0.92 |

For Lasso and Ridge, they both provide smaller coefficients of each parameter. Also, they both provide lower R2 score. To sum up, these two regularization algorithms successfully ease the overfitting issues of single polynomial. In other words, they make the model simpler.