1. Multiple Linear Regression (R2 Value) **-> 0.7894**
2. Support Vector Machine (R2 Value)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| # | **C Value** | ***linear*** | ***poly*** | ***Rbf*** | ***sigmoid*** |
| 1 | C=10 | 0.5665127071413464 | 0.15939211299328304 | -0.0181073414970 31415 | 0.07305556364057941 |
| 2 | C=100 | 0.6359503582045236 | 0.7508192250928143 | 0.3906016252797221 | 0.5275603784333978 |
| 3 | C=500 | 0.7651432120261669 | 0.8593128443964948 | 0.6964683962086491 | 0.49063576710300794 |
| 4 | C=1000 | 0.7440908870578434 | 0.8605846769982768 | 0.8283522647073256 | 0.14377558585363814 |
| 5 | C=2000 | 0.7414238870003889 | 0.8601812652768445 | 0.860735611608685 | -2.58403460184 76166 |
| 6 | **C=3000** | 0.7414231687803714 | 0.8600116233115994 | **0.8685317919090658** | -6.82618855418 4681 |

Note: kernel = precomputed is not fit since the table data size is 936\*7 model.

The SVM Regression use R2 Value **with linear and C=3000 = 0.8685**

1. Random Forest (R2 Value)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Criterion** | **max\_features** | **n\_estimators** | **R2****Value** |
| **1** | mse | **-** | 10 | 0.8392 |
| **2** | mse | **-** | 100 | 0.8552 |
| **3** | mse | sqrt | 10 | 0.8569 |
| **4** | mse | sqrt | 100 | **0.8698** |
| **5** | mse | log2 | 10 | 0.8569 |
| **6** | mse | log2 | 100 | **0.8698** |
| **7** | mae | **-** | 10 | 0.8331 |
| **8** | mae | **-** | 100 | 0.8532 |
| **9** | mae | sqrt | 10 | 0.8405 |
| **10** | mae | sqrt | 100 | 0.8657 |
| **11** | mae | log2 | 10 | 0.8405 |
| **12** | mae | log2 | 100 | 0.8657 |

1. Decision Tree (R2 Value)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Criterion** | **max\_features** | **splitter** | **R2****Value** |
| **1** | mae | **-** | best | 0.6672 |
| **2** | mae | **-** | Random | **0.7537** |
| **3** | mae | sqrt | best | 0.7326 |
| **4** | mae | sqrt | random | 0.6635 |
| **5** | mae | log2 | best | 0.7326 |
| **6** | mae | log2 | random | 0.6635 |
| **7** | poisson | **-** | best | 0.7100 |
| **8** | poisson | **-** | random | 0.7009 |
| **9** | poisson | sqrt | best | 0.7318 |
| **10** | poisson | sqrt | Random | 0.7032 |
| **11** | poisson | log2 | best | 0.7318 |
| **12** | poisson | log2 | random | 0.7032 |
| **13** | friedman\_mse | **-** | best | 0.7088 |
| **14** | friedman\_mse | **-** | random | 0.6988 |
| **15** | friedman\_mse | sqrt | Best | 0.7281 |
| **16** | friedman\_mse | sqrt | random | 0.6926 |
| **17** | friedman\_mse | log2 | best | 0.7281 |
| **18** | friedman\_mse | log2 | random | 0.6926 |

The Decision Tree R2 Value **for criterion – mae; max\_features – none; splitter – Random = 0.7537**

**Justification of Model Selection:**

I chose model **‘Random Forest’** because, it yields better r2\_score - **0.8698**.