**Classification Models**

|  | **Math Scores** | | | | **Reading/Writing Scores** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **F1** | **Acc.** | **Prec.** | **Rec.** | **F1** | **Acc.** | **Prec.** | **Rec.** |
| **Random Forest** | 0.48 | 0.61 | 0.5 | 0.46 | 0.61 | 0.62 | 0.62 | 0.60 |
| **Logistic Regr.** | **0.57** | **0.68** | **0.60** | **0.55** | **0.68** | **0.69** | **0.70** | 0.66 |
| **KNeighbors** | 0.47 | 0.59 | 0.47 | 0.46 | 0.59 | 0.59 | 0.59 | 0.59 |
| **Decision Tree** | 0.42 | 0.61 | 0.50 | 0.36 | 0.56 | 0.60 | 0.61 | 0.52 |
| **SVM** | **0.58** | **0.68** | 0.59 | 0.56 | **0.68** | 0.68 | 0.68 | **0.68** |

**Regression Models**

**Ordinary Least Squares** - Model fit to training set

*On Reading/Writing scores*

| **Dep. Variable:** | r/w score | **R-squared:** | 0.281 |
| --- | --- | --- | --- |
| **Model:** | OLS | **Adj. R-squared:** | 0.275 |
| **Method:** | Least Squares | **F-statistic:** | 48.35 |
| **Date:** | Sun, 29 Aug 2021 | **Prob (F-statistic):** | 5.70e-66 |
| **Time:** | 11:08:09 | **Log-Likelihood:** | -3943.4 |
| **No. Observations:** | 1000 | **AIC:** | 7905. |
| **Df Residuals:** | 991 | **BIC:** | 7949. |
| **Df Model:** | 8 |  |  |
| **Covariance Type:** | nonrobust |  |  |

|  | **coef** | **std err** | **t** | **P>|t|** | **[0.025** | **0.975]** |
| --- | --- | --- | --- | --- | --- | --- |
| **const** | 66.0548 | 1.667 | 39.627 | 0.000 | 62.784 | 69.326 |
| **standard** | 7.7386 | 0.831 | 9.313 | 0.000 | 6.108 | 9.369 |
| **no prep** | -8.8706 | 0.830 | -10.691 | 0.000 | -10.499 | -7.242 |
| **parental level of education** | 2.0399 | 0.274 | 7.453 | 0.000 | 1.503 | 2.577 |
| **group B** | 1.0660 | 1.615 | 0.660 | 0.509 | -2.104 | 4.236 |
| **group C** | 2.1866 | 1.513 | 1.445 | 0.149 | -0.782 | 5.155 |
| **group D** | 5.0100 | 1.543 | 3.246 | 0.001 | 1.981 | 8.039 |
| **group E** | 5.2149 | 1.711 | 3.047 | 0.002 | 1.857 | 8.573 |
| **male** | -8.1486 | 0.798 | -10.209 | 0.000 | -9.715 | -6.582 |

*On Math scores….*

| **Dep. Variable:** | **math score** | **R-squared:** | **0.251** |
| --- | --- | --- | --- |
| **Model:** | **OLS** | **Adj. R-squared:** | **0.245** |
| **Method:** | **Least Squares** | **F-statistic:** | **41.58** |
| **Date:** | **Sun, 29 Aug 2021** | **Prob (F-statistic):** | **1.72e-57** |
| **Time:** | **11:08:09** | **Log-Likelihood:** | **-3992.6** |
| **No. Observations:** | **1000** | **AIC:** | **8003.** |
| **Df Residuals:** | **991** | **BIC:** | **8047.** |
| **Df Model:** | **8** |  |  |
| **Covariance Type:** | **nonrobust** |  |  |

|  | **coef** | **std err** | **t** | **P>|t|** | **[0.025** | **0.975]** |
| --- | --- | --- | --- | --- | --- | --- |
| **const** | **52.8766** | **1.751** | **30.200** | **0.000** | **49.441** | **56.313** |
| **standard** | **10.8994** | **0.873** | **12.488** | **0.000** | **9.187** | **12.612** |
| **no prep** | **-5.6195** | **0.872** | **-6.448** | **0.000** | **-7.330** | **-3.909** |
| **parental level of education** | **1.6662** | **0.287** | **5.796** | **0.000** | **1.102** | **2.230** |
| **group B** | **1.8897** | **1.697** | **1.114** | **0.266** | **-1.440** | **5.220** |
| **group C** | **2.3755** | **1.589** | **1.495** | **0.135** | **-0.743** | **5.494** |
| **group D** | **5.3573** | **1.621** | **3.304** | **0.001** | **2.176** | **8.539** |
| **group E** | **10.1181** | **1.798** | **5.629** | **0.000** | **6.591** | **13.645** |
| **male** | **4.9492** | **0.838** | **5.903** | **0.000** | **3.304** | **6.594** |

| **Omnibus:** | **8.601** | **Durbin-Watson:** | **2.041** |
| --- | --- | --- | --- |
| **Prob(Omnibus):** | **0.014** | **Jarque-Bera (JB):** | **8.767** |
| **Skew:** | **-0.225** | **Prob(JB):** | **0.0125** |
| **Kurtosis:** | **2.911** | **Cond. No.** | **22.5** |

**OLS**

|  | **Reading &**  **Writing** | **Math** |
| --- | --- | --- |
| **R2 score** | 0.23 | 0.21 |
| **Mean absolute error** | 10.19 | 11.06 |
| **Mean squared error** | 162.41 | 187.55 |

**Linear Regression**

|  | **Reading &**  **Writing** | **Math** |
| --- | --- | --- |
| **R2 score** | 0.23 | 0.19 |
| **Mean absolute error** | 10.29 | 11.16 |
| **Mean squared error** | 175.32 | 197.47 |

**Ridge Regression**

|  | **Reading &**  **Writing** | **Math** |
| --- | --- | --- |
| **R2 score** | 0.23 | 0.19 |
| **Mean absolute error** | 10.29 | 11.16 |
| **Mean squared error** | 175.35 | 197.60 |

**Lasso Regression**

|  | **Reading &**  **Writing** | **Math** |
| --- | --- | --- |
| **R2 score** | 0.18 | 0.13 |
| **Mean absolute error** | 10.70 | 11.50 |
| **Mean squared error** | 186.93 | 212.90 |