11.1.1 – Please review the included R file 11.1.1.R along with the explanation

First, I loaded and inspected the data. Unlike in some previous assignments using this dataset, I checked for multicollinearity, but decided not to remove any correlated predictors, as I wanted to see how each of the models would deal with that issue.

I then split the data into to training and test data, using 80% of the data for the training set and the remaining 20% for the test set.

I then created a basic model with only one predictor and ran a forward stepwise regression using the stepAIC function from the MASS package. This function can perform both forward and backward stepwise regression based on AIC. The final model from the forward step used the factors M + Po1 + Ineq + Ed + Prob + Wealth and had an AIC of 403.13. The predictor added at each step and the resulting model quality is shown below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Step | Df | Deviance | Resid. Df | Resid. Dev | AIC |
| 1 |  |  | 35 | 4260568 | 435.1978 |
| 2 | 1 | 1831892.71 | 34 | 2428676 | 416.4017 |
| 3 | 1 | 269794.94 | 33 | 2158881 | 414.0448 |
| 4 | 1 | 428184.44 | 32 | 1730696 | 407.8653 |
| 5 | 1 | 272778.27 | 31 | 1457918 | 403.5193 |
| 6 | 1 | 90998.64 | 30 | 1366919 | 403.1346 |

Running backward stepwise regression did not remove any of these predictors as doing so did not improve AIC.

I then used the test data and hypothetical test city from previous assignments to test the model. The R2 using the predictors listed above was .83, and the model predicted a crime rate of 940 in the test city.

11.1.2 – Please review the included R file 11.1.1.R along with the explanation

11.1.3 – Please review the included R file 11.1.1.R along with the explanation