**Problem Set #4**

**Please see the end of the Doc for all coding used**

1. Standardized Residuals Problem in Major Latino City
   1. 3.79
   2. P-value = 0.15; With an alpha of .1 we cannot conclude that there is no relationship between one’s class and whether they can successfully bribe a police officer.
   3. Standardized Residuals in Each Cell

|  |  |  |  |
| --- | --- | --- | --- |
|  | Not Stopped | Bribed | Stopped/Warning |
| Upper Class | 0.136 | -0.815 | 0.819 |
| Lower Class | -0.183 | 1.094 | -1.099 |

* 1. The Relatively low absolute value of the standardized residuals (between -2 and 2) tells me that all observed values fall within a reasonably similar amount of frequency as what can be expected.

1. Voting Signs
   1. The R-squared value is so low in its absolute value, we cannot reject a null hypothesis of there being a connection between signs in your precinct and votes going to the incumbent.
   2. There is no reason to suggest that there is a significant impact being in an adjacent precinct.
   3. The coefficient here suggests that a larger impact should be present.
   4. A no relation correlation model (something very close to r=0) is going to fit this particular dataset
2. Women in Leadership vs Effects on Water Facility Restoration Projects
   1. Null Hypothesis: There is no relationship between the reservation policy and new or repaired water facilities (the slope of the regression line is 0). Alternate: There is a relationship between the two (the slope of the regression line is not zero).
   2. See codes below under “# Question Three”. P-value = 0.0197. With such a low p-value we can reject the null hypothesis that there is no correlation.
   3. With the reservation policy (with more women in power) about 9.25 more water facility projects are undertaken.
3. Prestige Questions
   1. See R codes under “# Question Four”
   2. See R codes under “# Question Four”
   3. Y = 21.14 + 0.0032(X-income) + 37.78 (X-professional) - 0.0023 (X-relations of both)
   4. It requires a very large increase in income before prestige increases noticeable amounts.
   5. A switch from non-professional to professional jobs shows a much faster increase in prestige than income would.
   6. Difference in Prestige = 3.2 (See notes for numbers punched into equation)
   7. Difference in Prestige = 37.78 (See notes). Change in prestige is massive when one switches from a non-professional job to a professional one.
4. Multiple Regressions
   1. See Codes for Regressions below under “# Question Five”
   2. R-Squared and R-Squared Adjusted Table

|  |  |  |
| --- | --- | --- |
|  | R- Squared | Adj. R-Squared |
| Model 1 | 0.083 | 0.080 |
| Model 2 | 0.0897 | 0.083 |
| Model 3 | 0.244 | 0.236 |
| Model 4 | 0.509 | 0.502 |
| Model 5 | 0.509 | 0.500 |
| Model 6 | 0.418 | 0.416 |

* 1. Model 5 had the highest R-squared value. In general there was an increase in the R-squared value with Model 6 being the outlier having only one variable, but the third highest R-squared value.

1. Incumbents\_Subset Questions
   1. We are interested in knowing how the difference in campaign spending between incumbent and challenger affects the incumbent’s vote share.
      1. See Code
      2. See Code
      3. See Code
      4. Equation in code of #Question Six
   2. We are interested in knowing how the difference between incumbent and challenger’s spending and the vote share of the presidential candidate of the incumbent’s party are related.
      1. See Code
      2. See Code
      3. See Code
      4. Equation in code of #Question Six
   3. We are interested in knowing how the vote share of the presidential candidate of the incumbent’s party is associated with the incumbent’s electoral success.
      1. See Code
      2. See Code
      3. Equation in code of #Question Six
   4. The residuals from part (a) tell us how much of the variation in voteshare is not explained by the difference in spending between incumbent and challenger. The residuals in part (b) tell us how much of the variation in presvote is not explained by the difference in spending between incumbent and challenger in the district.
      1. See Code
      2. See Code
      3. Equation in Code
   5. What if the incumbent’s vote share is affected by both the president’s popularity and the difference in spending between incumbent and challenger?
      1. See Code
      2. Equation in Code
      3. There are no exact matches in any of the output data

Collaborated with Michael and Luke