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POS 604: Quantitative Methods

Dr. Meserve

**Regression Revisited**

**Question 1a.**

Table 1. Correlation of votes between presidential candidates and county votes

Candidate Correlation

Hilary Clinton 0.97

Donald Trump 0.97

Note: Figures are rounded in 2 decimal places

From table 1, the correlation between Hilary Clinton and the Democratic governors’ vote in the counties is 0.97 which is very close to one, and that depicts a strong correlation. The governors’ county votes have a strong positive correlation with their presidential candidate’s votes. If a Democratic governor’s votes in the county in 2014 were high, all the other variables kept constant, their presidential candidate’s (Hilary Clinton) votes would be high as well.

Also, the correlation between Donald Trump’s vote and the Republican governors’ vote is 0.97 which is very close to one and depicts a strong correlation. If a Republican governor’s votes in the county in 2014 were high, all the other variables kept constant, their presidential candidate’s (Donald Trump) votes would be high.

**Question 1b.**

Table 2. Democratic presidential candidate’s vote with democrat governors’ vote as predictor

Regression line Coefficients std. error upper limit lower limit

intercepts -3893.93 522. -4917. -2869.

demgov14 2.12 0.012 2.09 2.14

Note: Figures are rounded in 2 decimal places

Fitted regression line is:

Y = -3893.93 + 2.12x + e

From table 2, a change in democratic governor’s county votes in 2014 leads to 2.12 votes for the Democratic presidential candidate (Hilary Clinton) in 2016.

Table 3. Republican presidential candidate’s vote with republican governors’ vote as a predictor

Regression line Coefficients std. error upper limits lower limit

Intercepts 1018.81 263. 504. 1534.

Repgov14 1.45 0.007 1.43 1.46

Note: Figures are rounded in 2 decimal places

Fitted regression line is:

Y = 1010.81 + 1.45x + e

From table 3, a change in the Republican governor’s votes in 2014 leads to 2.12 votes for the Republican presidential candidate (Donald Trump) in 2016.

**Question 2**

Table 4.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **trump percent** | | |
| *Predictors* | *Estimates* | *std. Error* | *CI* |
| (Intercept) | -15.81 \*\*\* | 3.49 | -24.81 – -6.82 |
| black pct | -0.46 \*\*\* | 0.01 | -0.50 – -0.42 |
| Hispanic pct | -0.22 \*\*\* | 0.02 | -0.26 – -0.19 |
| age65andolder pct | 0.03 | 0.05 | -0.10 – 0.17 |
| median hh inc | 0.00 \*\*\* | 0.00 | 0.00 – 0.00 |
| lesscollege pct | 0.91 \*\*\* | 0.03 | 0.83 – 0.99 |
| rural pct | 0.09 \*\*\* | 0.01 | 0.06 – 0.11 |
| Observations | 3111 | | |
| R2 / R2 adjusted | 0.534 / 0.533 | | |
| *\* p<0.1   \*\* p<0.05   \*\*\* p<0.01* | | | |

**Question 3**

From table 4, we reject all the variables except ages 65 and older with 99 percent confidence.

The p-value of age 65 and older percent (0.03) is greater than 0.01 and we do not reject the null hypothesis that the population 65 years or older as a percentage of the total population’s coefficient is equal to 0.

**Question 4**

From table 4, a change in black vote percentage reduces Trump votes by 0.46. Hence, keeping all other variables constant, a change in percentage vote in the county by black votes lead to a 0.46-point reduction in Trumps’ vote. Also, from table 4, an increase in the percentage of the Hispanic population reduces Trump’s vote by 0.22 points keeping all other variables constant.

**Question 5**

Graph 1. Graph with all independent variables.

**Chart, line chart

Description automatically generated**

**Question 6**

Table 5. Trump vote percent model with Hispanic and rural vote percent interacting

|  |  |  |  |
| --- | --- | --- | --- |
|  | **trump percent** | | |
| *Predictors* | *Estimates* | *std. Error* | *CI* |
| (Intercept) | -16.33 \*\*\* | 3.45 | -25.23 – -7.44 |
| black pct | -0.46 \*\*\* | 0.01 | -0.50 – -0.43 |
| hispanic pct | -0.39 \*\*\* | 0.02 | -0.46 – -0.33 |
| rural pct | 0.05 \*\*\* | 0.01 | 0.02 – 0.07 |
| age65andolder pct | 0.03 | 0.05 | -0.10 – 0.17 |
| median hh inc | 0.00 \*\*\* | 0.00 | 0.00 – 0.00 |
| lesscollege pct | 0.94 \*\*\* | 0.03 | 0.86 – 1.02 |
| hispanic pct \* rural pct | 0.00 \*\*\* | 0.00 | 0.00 – 0.01 |
| Observations | 3111 | | |
| R2 / R2 adjusted | 0.545 / 0.544 | | |
| *\* p<0.1   \*\* p<0.05   \*\*\* p<0.01* | | | |

**Question 7**

**Graph 2**

Graph showing the interaction of Hispanic population and rural percent with other independent variables.

**Chart, line chart

Description automatically generated**

In the graph above, the parallel lines mean there are no interaction effects between the Hispanic population with rural variables on Trump’s vote. Additionally, the interaction model provided more information about the lower quartile and upper quartile range. The lower quartile (27.03) has a steep slope for Trump’s vote as against the gentle slope for the third quartile (89.93).