

Practice Quiz 4

Statistics 90-707

Fall 2021

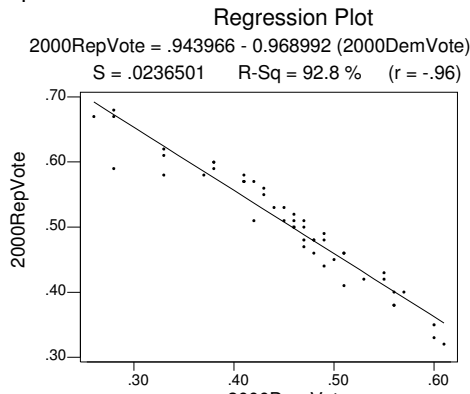
Dr. Nancy Pfenning

1. (4 pts.) The U.S. government reported on hate crimes for a recent year, noting whether the offender was black or white and whether or not the crime was due to the victim's sexual orientation. The data are shown in this two-way table.

	Against Sexual Orientation	Other Reason	Total
White Offender	680	3030	3710
Black Offender	210	870	1080
Total	890	3900	4790

- (a) Report the proportions of hate crimes due to sexual orientation for white offenders and for black offenders.
- (b) Compare the proportions and tell whether or not it is large enough to convince you that race of the offender plays an important role in whether a hate crime is committed due to the victim's sexual orientation.
- (c) What is considered to be the explanatory variable here?

2. (6 pts.) Proportion voting republican was regressed on proportion voting democratic for all 50 states in the presidential election of 2000.



The regression equation is Rep = .944 - .969 Dem
 S = .02365 R-Sq = 92.8% R-Sq(adj) = 92.6%

Unusual Observations

Obs	Dem	Rep	Fit	SE Fit	Residual	St Resid
2	.280	.59000	.67265	.00753	-.08265	-3.69R
44	.260	.67000	.69203	.00824	-.02203	-0.99 X

R denotes an observation with a large standardized residual

X denotes an observation whose X value gives it large influence.

- Based on the scatterplot, which one of these is a reasonable guess for the mean proportion who voted Democratic? (i) 0.35 (ii) 0.45 (iii) 0.55 (iv) 0.65
- Standard deviation was roughly the same for both distributions, proportion voting Democratic and proportion voting Republican. Which one of these is a reasonable guess for standard deviation? (i) 0.01 (ii) 0.10 (iii) 1.0 (iv) 10
- The scatter is fairly uniform above and below the line, indicating that the distribution voting Republican is (i) skewed left (ii) symmetric (iii) skewed right
- In Pennsylvania, the proportion voting Democratic in 2000 was 0.51. What proportion do you predict voted Republican? _____
- Your prediction in (d) isn't perfect; it's probably off by about how much?
- In fact, the proportion voting Republican in Pennsylvania was .46. Report the residual (prediction error) for this observation. (Be sure to get the correct sign).
- Based on the reported value of R-Sq, find the correlation:
 (i) -9.6 (ii) -0.96 (iii) -0.096 (iv) +0.096 (v) +0.96 (vi) +9.6
- Would it also make sense to take proportion Republican as explanatory variable?
 - If explanatory and response roles were switched, which of these would change?
 (i) the equation of the regression line (ii) the correlation (iii) both (iv) neither
 - If the data were entered as percentages instead of proportions, such as 51 and 46 for Pennsylvania, the value of r would (i) increase (ii) decrease (iii) stay the same
- The proportion voting Democratic for the state with a large amount of influence was _____; for the state with an unusually large residual, it was _____.