# Practice Quiz 4

Statistics 0200
Dr. Nancy Pfenning

1. (2 pts.) A large group of drivers participated in an online survey about their driving habits. This table shows the probability of the respondents driving various types of cars.

| Type | Economy | Family | Luxury | Sports | Truck | Utility | Van |
|---|---|---|---|---|---|---|---|
| Probability | .33 | .22 | .06 | .14 | .11 | .10 | .04 |

   (a) What is the probability of not driving an economy car?

   (b) What is the probability of a respondent driving a truck, utility vehicle, or van?

   (c) If two respondents are chosen at random, what is the probability that both drive utility vehicles?

2. (3 pts.) This table classifies 2000 Americans with respect to age group and having health insurance or not.

|  | College-Aged | Other | Total |
|---|---|---|---|
| Insured | 140 | 1560 | 1700 |
| Uninsured | 60 | 240 | 300 |
| Total | 200 | 1800 | 2000 |

   (a) Find the probability of being college-aged or uninsured.

   (b) Find the probability of being college-aged and uninsured.

   (c) The explanatory variable is _____ and this table displays it along the (i) rows (ii) columns

   (d) What is the conditional probability of being uninsured, given that someone is college-aged?

   (e) What is the conditional probability of being uninsured, given that someone is non-college-aged?

   (f) Does there appear to be a substantial relationship between being college-aged or not and having health insurance or not? Explain.

   (g) Notice that altogether, 300 of those 2000 were uninsured. If equal proportions were uninsured, then _____ of the 200 college-aged individuals would be uninsured, and _____ of the 1800 others would be uninsured.

2. (5 pts.) Proportion voting republican was regressed on proportion voting democratic for all 50 states in the presidential election of 2000.

Regression Plot
2000RepVote = .943966 - 0.968992 (2000DemVote)
S = .0236501     R-Sq = 92.8 %    (r = -.96)
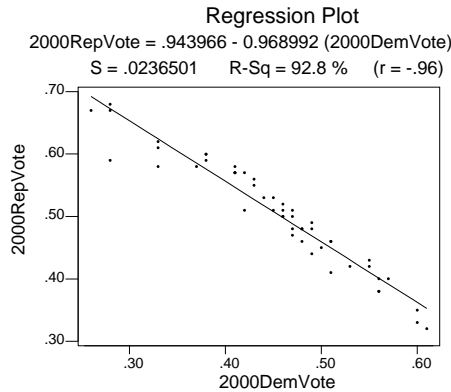


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The regression equation is
Rep = .944 - .969 Dem
S = .02365        R-Sq = 92.8%      R-Sq(adj) = 92.6%
Unusual Observations
Obs      Dem        Rep         Fit       SE Fit     Residual     St Resid
 2      .280      .59000      .67265      .00753     -.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.
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(a) Based on what you see in 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

(b) 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

(c) The fact that the scatter is fairly uniform above and below the line indicates that the distribution voting Republican is (i) skewed left (ii) approximately symmetric (iii) skewed right

(d) In Pennsylvania, the proportion voting Democratic in 2000 was 0.51. What proportion do you predict voted Republican?

(e) Your prediction in (d) isn't perfect; it's probably off by about how much?

(f) In fact, the proportion voting Republican in Pennsylvania was .46. Report the residual (prediction error) for this observation, making sure to get the correct sign.

(g) 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

(h) Would it make just as much sense to take proportion voting Republican to be the explanatory variable?

(i) 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

(j) 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

(k) For the state with a large amount of influence, the proportion voting Democratic was _____; for the state with an unusually large residual, the proportion voting Democratic was _____.