

Bus 274: Further Statistics for Business

Spring 2015

PROBLEM SHEET # 11

Problem 1: File `car_insurance_call_center.xls` contains data on the duration of calls in seconds (variable `talk.time`) and the wrap-up time after calls (variable `wrap.up.time`) in a call center of a car insurance company. The observations were made on a single day.

- Make a scatterplot of the data.
- Compute the correlation r between the two variables.
- Compute a 95% confidence interval for the correlation (as a parameter of the bivariate normal distribution) of the two variables, using the following expression for the standard error:

$$\sqrt{\frac{1 - r^2}{n - 2}}$$

What are your conclusions?

Problem 2: Voter turnout is the percentage of eligible voters who actually cast a ballot in an election. A possibly low voter turnout is a serious obstacle to the prediction of the election outcome, especially if the probability of voting is related to the party the potential voter would vote for. A survey was held in a district with only three parties A , B and C . Interviews with 1000 eligible voters resulted in the following table:

| | | planning to vote? | |
|-------|-----|-------------------|-----|
| | | Y | N |
| party | A | 100 | 100 |
| | B | 200 | 100 |
| | C | 400 | 100 |

- Compute the expected joint frequencies, given the marginal frequencies, assuming party support and the intention to vote are independent.
- Compute an approximate 95% confidence interval for the share of A .
- Compute an approximate 95% confidence interval for the share of A among those who are actually planning to vote.
- Conduct a χ^2 test of independence, using a 5% level of significance.
- What do these results imply for the three parties?