University of Texas at Austin

Problem Set # 11

Test of significance.

Problem 11.1. A test of significance can be used to test differences in categorical data. *True or false? Why?*

Solution: FALSE
There is no notion of distance for categorical data. So, there is no notion of at the observed value or **more extreme**.

Problem 11.2. Confidence intervals and two-sided significance tests are linked in the sense that a two-sided test at a significance level α can be carried out in the form of a confidence interval with confidence level $1-\alpha$. *True or false?*

Solution: TRUE

Problem 11.3. In a test of statistical hypotheses, what does the $p-$value tell us?

- **a.** If the null hypothesis is true.
- **b.** If the alternative hypothesis is true.
- **c.** The largest level of significance at which the null hypothesis can be rejected.
- **d.** The smallest level of significance at which the null hypothesis can be rejected

Solution: d.

Complete the following statements:

Problem 11.4. When computing $p-$values, if the $p-$value is smaller than the chosen significance level α, we say that the results are _____.

Solution: ...statistically significant

Provide your **complete solution** for the following problems.

Problem 11.5. You perform 2000 significance tests using a significance level 0.10. Under the assumption that all of the null hypotheses for the 2000 significance tests are true, how many of the 2000 significance tests would you expect to be statistically significant?

- **a.** 200
- **b.** 1800
- **c.** 2000
- **d.** 0
- **e.** None of the above.

Solution: a.