Problem Set 5: POLS 3316
Statistics for Political Science
University of Houston
Fall 2023
Due November 15, 2023, 11:59 PM

For both problems, be sure to show work as instructed and to fill in the score, p-value, and whether you retain or reject the null hypothesis. Answer any specific questions.

1. Complete a X^2 (Chi-square) hypothesis test of indendence on the following data. The extra tables are for your convenience, but you must set up the initial table, figure the totals and sample sizes, and expected values. You can get the p-value using the table or the R function for chis-quare probability distribution:

Treated patients, no improvement: 50
Treated patients, with improvement: 75
Untreated patients, no improvement: 60
Untreated patients, with improvement: 75

H0: The variables are independent (treatment is unrelated to improvement.)
H1: The variables are dependent (treatment affects improvement.)

Table 1: The data

Table 2: with Marginal Frequencies (totals)

Table 3: expected outcomes

Extra tables for work:

Chi-Square Score X^2: _____

p-value: _____

Retain or reject the null: _____

_____

2. Complete a paired samples T-test on the following sample.

Show your work: you may either copy and paste all your R code into a document or show the math steps.

H0: The true mean difference between the paired samples is zero.
H1: The true mean difference between the paired samples is not equal to zero.

Is this a one or two tailed test? _____

Student	Score 1	Score 2
1	3	15
2	2	13
3	3	14
4	12	21
5	15	30
6	16	31
7	17	23
8	19	21
9	23	25

t-score: _____

p-value: _____

Retain or reject the null: _____