Stats 300 **Spring 2024**

Lab Assignment #25

This lab is due at 9:35 AM on Wednesday 5/8 and is worth 6 points. This may be done individually, or in a group of 2 or 3 people.

Write a 1-sentence summary for each problem. Write hypotheses for each hypothesis test problem.

1) In 2010, 56% of adults had both a landline phone and a cellphone, 28% had only a cellphone, 12% had only a landline phone, and 4% had no phone. A current survey of 302 adults finds that 161 have both a landline phone and a cellphone, 109 have only a cellphone, 21 have only a landline phone, and 11 have no phone. Does the survey show, at the 5% significance level, that the proportions of phone ownership have changed since 2010? Which category(s) is/are most suspicious?

2) A statistics book has a table of random digits, to help students with various sampling simulations. One would assume that the digits were chosen so that there is a 10% probability that each digit is 0, a 10% probability that each digit is 1, ... etc ... , and a 10% probability that each digit is 9. Test the claim, with $\alpha = 10\%$, that this assumption is valid. Treat the first 500 digits in the table as a simple random sample. Which digit(s) is/are most suspicious?

Digit	Frequency
0	29
1	43
2	54
3	52
4	50
5	48
6	65
7	58
8	55
9	46

Note: these are real data from "random" digits from a real stats book!

3) Test the claim that in Major League Baseball games, 30% of outs made are flyouts (batted balls caught before touching the ground), 30% are forceouts (a runner is forced to run to a base, but a fielder in possession of the ball touches the base or runner first), 30% are strikeouts (the batter gets 3 strikes, with the third strike caught by the catcher, or occuring while first base is occupied with less than two out, or the third strike is a foul bunt, etc., etc.), and 10% are other kinds of outs (most commonly, but not limited to, being tagged by the ball while not touching a base on a non-force play). Use a 5% significance level. Which type(s) of out is/are most suspicious?

A random sample of games gives 322 flyouts, 289 forceouts, 275 strikeouts, and 91 other outs.