# In-Class Worksheet

## Practicing Statistical Inference

### STAT011 with Prof Suzy

**Name:** _____

**Instructions:** There are 5 questions in this worksheet. The first four questions are solvable with hypothesis tests about one or two proportions or means. The last question asks you to consider when to use each of the chi-square tests for categorical variable. You will work with your group members to answer each question.

## Problem 1

The Centers for Disease Control and Prevention reports that 9.3% of surveyed high school students reported in 2015 that they had smoked cigarettes in the past 30 days. A college has 522 students in its freshman class. How likely is it that more than 10% of them are smokers?

## Problem 2

A national vital statistics report indicated that about 3% of all births produced twins. Is the rate of twin births the same among very young mothers? Data from a large city hospital found that only 7 sets of twins were born to 469 teenage girls.

## Problem 3

The National Perinatal Statistics Unit of the Sydney Children's Hospital reports that the mean birth weight of all babies born in birth centers in Australia in a recent year was 3564 grams—about 7.86 pounds. A Missouri hospital reports that the average weight of 112 babies born there last year was 7.68 pounds, with a standard deviation of 1.31 pounds. We want to see if U.S. babies weigh the same, on average, as Australian babies.

## Problem 4

Suppose we purchase $n = 6$ random bags of chips marked with a net weight of 35.4 grams. We then carefully weighing the contents in each bag to find the following weight data (in grams):

```
chips = c(35.5, 35.3, 35.1, 36.4, 35.4, 35.5)
```

Is there evidence that the mean weight of these chip bags is less than advertised?

## Problem 5

Which of the three chi-square tests — goodness-of-fit, homogeneity, or independence — would you use in each of the following situations?

- A restaurant manager wonders whether customers who dine on Friday nights have the same preferences among the four "chef's special" entrees as those who dine on Saturday nights. One weekend he has the wait staff record which entrees were ordered each night. Assuming these customers to be typical of all weekend diners, he'll compare the distributions of meals chosen Friday and Saturday.

- Company policy calls for parking spaces to be assigned to everyone at random, but you suspect that may not be so. There are three lots of equal size: lot A, next to the building; lot B, a bit farther away; and lot C, on the other side of the highway. You gather data about 120 managers to see how many were assigned parking in each lot.

- Is a student's social life affected by where the student lives? A campus survey asked a random sample of students whether they lived in a dormitory, in off-campus housing, or at home, and whether they had been out on a date 0, 1–2, 3–4, or 5 or more times in the past two weeks.