PSYC 60 – Statistics
Spring 2012
Quiz 4 – Example (version 1.1)

Name: _____

Signature: _____

Student #: A_____

Instructions

Calculators (simple & graphing) will be allowed along with one page with a single side of handwritten notes. You will receive a copy of the chi-square table with this quiz. You will have the full class period (50 minutes minus setup time).

Correlation

1. The batting coach of a baseball team determines that the number of hits a player gets in a game is almost entirely predicted by the number of hours he spends in batting practice. What is the most likely r value?

a. -1.0
b. -0.4
c. 0.0
d. 0.1
e. 0.9

2. Given the following z scores, calculate the r value:

Z of X	Z of Y
-0.70	-1.11
1.14	0.29
-0.44	0.82

a. 0.37
b. 0.21
c. 0.12
d. -0.68
e. -0.19

3. What is the t value for a correlation of r = 0.82 and n = 12?

a. 0.82
b. 1.34
c. 1.84
d. 4.53
e. 6.61

Regression

4. College freshmen eat an average of 9 slices of pizza a week with SS = 15. They gain the notorious average of 15 pounds with SS = 50. The correlation is 0.6 What is the formula for the least square regression line to predict weight gain?

a. $y = -0.3 x + 14.0$
b. $y = 1.1 x + 5.1$
c. $y = 2.4 x + 3.1$
d. $y = 7.5 x + 50.2$
e. $y = 15 x + 0.1$

5. Assume from the example above that the slope is 3 lbs/slice and the intercept is 1.5 lbs. Given the sample of three freshman below, what is the standard error of the estimate?

	Pizza	Actual Weight Gain
A:	4.5	12
B	0	5.0
C	2.1	-1.5

a. -0.4
b. 1.5
c. 12.52
d. 10.38
e. 20.53

Chi Squared

6. If 8% of a farmer's apples are spoiled and 4% of them have worms but these factors are independent, how many apples out of 2000 are fresh and worm-free?

a. 450.3
b. 839.0
c. 1203.2
d. 1766.4
e. 1766.0

7. A pollster finds that 2,403 people are planning to vote for Obama and 2,532 are planning to vote for Palin. You perform a test to determine if this sample provides evidence that the votes are not evenly split. What do you conclude?

a. X2 is 0.89 - conclude that the population of voters is likely not evenly split
b. X2 is 0.89 - conclude that the population of voters is likely evenly split
c. X2 is 3.37 - conclude that the population of voters is likely not evenly split
d. X2 is 3.37 - conclude that the population of voters is likely evenly split
e. X2 is 13.24 - conclude that the population of voters is likely not evenly split
f. X2 is 13.24 - conclude that the population of voters is likely evenly split

(This is what it means when pollsters talk about poll results being "within the margin of error". Ask about this on moodle if you are interested.)

8. A street vendor sells hot dogs and hamburgers with the strange rule that you can only have one condiment per order. He has a deep background in stats and decides to test whether order item and condiment are independent, so he tabulates the following order information. Are the factors independent?

	Hot Dog	Hamburger
Ketchup	43	112
Mustard	40	65

a. Significant because X2 is between 2 - 4
b. Not significant because X2 is between 2 - 4
c. Significant because X2 is is between 5-10
d. Not significant because X2 is between 5-10
e. Significant because X2 is greater than 10
f. Not significant because X2 is greater than 10

Conceptual

Rather than give you a few random questions for the quiz example, I've outlined the conceptual topics you should be fluent with. The actual test will have the multiple choice conceptual questions you've seen before.

Test selection

Be able to identify when you need to calculate a correlation versus a regression line.
Be able to identify data that requeires a chi-square test versus a z or t test.

Correlation

Relationships

- Be able to estimate the r value based on a scatter plot or description of the relationship
- Be able to describe the relationship between two variables based on the r value
- Identify factors which affect r value (e.g. outiers can make or ruin a strong correlation)
- Know typical r values, directions of relationships, strenth of relationships
- Understand what it means that r squared is "the percent of variance explained"
- Know the difference between the two different meanings of "correlation":
  - correlation as a mathematic description of a relationship between variables
  - correlation as opposed to causation

Standard Error of r

- Explain what the SE of r represents or is used for

Hypothesis test of r

- Understand why there is a hypothesis test for correlation
- Know how to determine degrees of freedom
- Be able to explain what a signiciant versus non-significant hypothesis test means

Regression

Know what a regression line is used for
Explain the advantages of the "least squares" regression line versus other possible regression lines
Know what the standard error of the estimate is measuring

Chi-square

Differentiate between expected/observed and proportion/frequency

Hypothesis test

- Be able to determine what expected proportions to test against in the null hypothesis based on the problem/question wording.
- Understand what degrees of freedom are based on and how this is different from past tests

Chi-square distribution

- Explain what it means that there is a distribution of chi-square values
- Identify the properties of the chi-square distribution
- Know what the chi-square table is used for and how to lookup values

Test for independece

- Be able to determine expected proportions for each cell
- Understand what a significant versus non-significant test means