This is an exam. You may consult any book and use any computer software.

**Print your name here:**

Please type up your answers to each question and submit your exam by email by Monday, July 14, 2014.

Question 1 (25 points). You asked your friends, John and Susan, to perform a coin tossing experiment. John reported that he tossed a balanced coin 100 times and obtained 49 heads. Susan reported that she tossed the same coin 100 times and obtained 51 heads. Because the results were so close to 50 heads out of 100, you wondered whether John and Susan made up their numbers. How would you analyze their results to address your own suspicion?

Question 2 (25 points). In the past five years the municipal government of Shanghai reported their estimates of the number of regular residents in Shanghai as 18.88, 23.00, 23.02, 23.47, 24.15 millions. Use the 5% level of significance, test the null hypothesis that the true number of residents is constant over the 5-year period versus the alternative hypothesis that there is a positive trend. Discuss the assumptions you need to make to perform the test.

Question 3 (50 points): Read the article “Statistical Errors” posted on the class website. Write a short essay (between 200 and 400 words) to reflect your thoughts about the p values. You may agree or disagree with any statements in the article, but it is always better to use an example that is familiar to you to illustrate your main point.