EXAM 1 K Foster, Principles of Statistics Eco 290, CCNY, Spring 2011	ID#:

The questions are worth 75 points. You have 75 minutes to do the exam, one point per minute.
All answers should be put into the blue books or submitted electronically.
You may refer to your books, notes, calculator, computer, or astrology table. The exam is "open book."
However, **you must not refer to anyone else, either in person or electronically**!
You must do all work on your own. Cheating is harshly penalized.
If you do work on the computer, please submit all those files via Blackboard and email.
Please silence all electronic noisemakers such as mobile phones.
Good luck. Stay cool.

1. (15 points) These questions are on Blackboard; please submit your answers there.
    a. For a Standard Normal distribution what is area to the right of 0.2? A. 0.5000 B. 0.8415 C. 0.4207 D. 0.4602
    b. For a Standard Normal distribution what is area to the right of 0.9? A. 0.3264 B. 0.1841 C. 0.8159 D. 0.3681
    c. For a Standard Normal distribution what is area to the right of 2.0? A. 0.0228 B. 0.8749 C. 0.1587 D. 0.0510
    d. For a Standard Normal distribution what is area to the left of 0.5? A. 0.0107 B. 0.0472 C. 0.6915 D. 0.3130
    e. For a Standard Normal distribution what is area to the left of -1.6? A. 0.1093 B. 0.0548 C. 0.1769 D. 0.9479
    f. For a Standard Normal distribution what is area in both tails farther from the mean than -2.2? A. 0.0916 B. 0.9868 C. 0.6005 D. 0.0278
    g. For a Standard Normal distribution what is area in both tails farther from the mean than 1.1? A. 0.0714 B. 0.2713 C. 0.4979 D. 0.1354
    h. For a Standard Normal distribution what is area in both tails farther from the mean than 0.8? A. 0.4237 B. 0.3364 C. 0.8474 D. 0.0546
    i. For a Standard Normal distribution what is area closer to the mean than 2.4? A. 0.9836 B. 0.0318 C. 0.9254 D. 0.1151
    j. For a Standard Normal distribution what values leaves probability 0.778 in both tails? ± 0.2819 ± 1.0705 ± 0.8950 ± 0.1745
    k. For a Standard Normal distribution what values leaves probability 0.281 in both tails? ± 0.9100 ± 1.6564 ± 1.0781 ± 2.1560

2. (20 points) These questions are on Blackboard; please submit your answers there.
    a. For a Normal Distribution with mean 12 and standard deviation 1.2, what is area to the right of 14.9? A. 0.7069 B. 0.0082 C. 0.0164 D. 0.1151
    b. For a Normal Distribution with mean -5 and standard deviation 1.8, what is area to the left of -7.7? A. 0.0027 B. 0.9973 C. 0.7734 D. 0.0668
    c. For a Normal Distribution with mean -5 and standard deviation 3.0, what is area to the left of -11.6? A. 0.0278 B. 0.9861 C. 0.1587 D. 0.0139
    d. For a Normal Distribution with mean 4 and standard deviation 0.9, what is area in both tails farther from the mean than 2.1? A. 0.1587 B. 0.0357 C. 0.9821 D. 0.7772
    e. For a Normal Distribution with mean 7 and standard deviation 7.1, what is area in both tails farther from the mean than 16.9? A. 0.3230 B. 0.1615 C. 0.1721 D. 0.1587

f. For a Normal Distribution with mean 3 and standard deviation 3.4, what values leaves probability 0.05 in both tails? A. (–4.6208, 10.6208), B. (–3.6639, 9.6639), C. (–2.5925, 8.5925), D. (–1.6449, 1.6449)
g. For a Normal Distribution with mean 8 and standard deviation 8.7, what values leaves probability 0.351 in both tails? A. (3.943, 12.057), B. (12.6124, 3.3876), C. (–4.5574, 12.4426), D. (–0.1141, 16.1141)
h. For a Normal Distribution with mean -11 and standard deviation 0.2, what values leaves probability 0.291 in both tails? A. (-10.9586, -11.0414), B. (-5.7112, -5.2888), C. (-56.0559, -53.9441), D. (-11.2112, -10.7888)

3. (20 points) Bloomberg News reported on a US audit of mortgages, showing that the average number of "seriously delinquent" loans originated by Countrywide (now owned by Bank of America) was 6.76%, versus a general average of 3.59% made by all other originators. There were 4050 loans made by Countrywide. (H. Son, D. Kopecki, D. Griffin, Oct. 5, 2011, "BofA May Face Fraud Claims for Soured Loans," Bloomberg News.)
   a. Test the null hypothesis that Countrywide's delinquent loan rate was actually not different from 3.59%; how likely is it that Countrywide was just unlucky? (What is the p-value?)
   b. Create a 95% confidence interval for Countrywide's delinquency rate. What is the 90% confidence interval? The 99% interval?
   c. What reasons, other than fraud, could explain why Countrywide's loans might have a higher delinquency rate?

4. (20 points) Using the PUMS data (available from Blackboard) on people in New York City, consider educational attainment.
   a. What fraction of people 25-55 have a college degree (associate, bachelor, or advanced)?
   b. Sampling people aged 25-55, what is the probability of finding someone with some college degree? With a bachelor or higher degree?
   c. What is the conditional probability that a person, age 25-55 and having some college degree, has a family income below the poverty line? Below 150% of the poverty line?
   d. Form a hypothesis test for whether the chance of being in poverty (under 100% of poverty line) is independent of degree. What is the p-value? What is a 95% confidence interval for the difference?
   e. Why do you think that we would find these results? Explain (perhaps with some further empirical results from the same data set).