University of California, Los Angeles
Department of Statistics

Statistics 13 **Instructor: Nicolas Christou**

Quiz 1
02 March 2016

Name: _____

Please submit the answers to the following questions using `R`. Upload a file with your `R` commands to `CCLE`. Note: Probabilities or percentiles of distributions must be computed using the functions `pnorm`, `qnorm`, etc.

1. Suppose you draw 15 cards with replacement. Find the probability of obtaining at least 5 clubs.

2. The number of pine trees per acre in a forest follows the Poisson distribution with parameter $\lambda = 10$. Find the probability that in a randomly selected acre from this forest we observe less than 8 pine trees.

3. Find the 8th percentile of $N(20, 3)$.

4. Suppose $X \sim N(20, 3)$. Find $P(13.5 < X < 24)$.

5. In a hypothesis testing for the mean with unknown standard deviation it was found that $t = 2.58$. The sample size was $n = 38$ and the hypothesis to test was
   $H_0 : \mu = 10$
   $H_a : \mu \neq 10$
   Find the p-value for this test.

6. Access the data:

   ```
   a <- read.table("http://www.stat.ucla.edu/~nchristo/statistics13/
        jura.txt", header=TRUE)
   ```

   Create a new data set with the following variables: `x, y, Cd, Cu, Pb`.

7. Use the data in question 6. Consider the variable `Cu`. Do the following: (a). Compute the summary statistics. (b). Construct its histogram and boxplot. (c). Construct a bubble plot .

8. Consider the data in question 6. Run the regression of `Pb` on `Cu`, plot `Pb` against `Cu`, and fit the regression line through the scatterplot.

9. Suppose $X_1, X_2, \ldots, X_{36}$ denotes a random sample from $N(10, 3)$. Find $P(\frac{35S^2}{9} > 50)$. (S^2 is the sample variance).

10. Consider the data in question 6. Construct the distribution of the sample mean when repeated samples of size $n = 100$ are selected from the variable `Pb`. Use 10000 samples.