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 $X \sim N(50, 5)$. Find P(60 < X < 65).
- 2. Suppose X_1, X_2, \ldots, X_{50} denotes a random sample from N(100, 10). Find $P(\frac{49S^2}{100} > 61)$. (S² is the sample variance).
- 3. Find the 13th percentile of N(50, 5).
- 4. The number of patients arrive at a clinic follows the Poisson distribution with parameter $\lambda = 20$ per hour. Find the probability that in the next hour we observe more than 25 patients.
- 5. 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, Ni, Cr.

- 6. In a hypothesis testing for the mean with unknown standard deviation it was found that t = 1.15. The sample size was n = 46 and the hypothesis to test was $H_0: \mu = 50$ $H_a: \mu > 50$ Find the p-value for this test.
- 7. Use the data in question 5. Consider the variable Cd. 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 5. Run the regression of Cd on Cr, plot Cd against Cr, and fit the regression line through the scatterplot.
- 9. Consider the data in question 5. Construct the distribution of the sample mean when repeated samples of size n = 100 are selected from the variable Cd. Use 10000 samples.
- 10. Suppose you roll two dice 20 times. Find the probability of obtaining at most 5 sums of 7.