BERD R Short Course  
Session 2 Homework Problems

1. List all R packages installed on your computer
2. Search on line to find an R package that does Classification and Regression Trees (CART). Note that you may be able to find multiple packages but just pick one from them
3. Install the R package your found in Problem 2 to your computer
4. List all functions in the R package found in Step 2
5. List all datasets contained in the R package found in Step 2
6. Run R command help (airquality) to learn more about the data frame airquality contained in the base package
7. Select Day 2 data from airquality with Temp > 90, and keep only the Temp variable
8. Write your own function one.t.test so that it will accept 2 arguments y and alpha, where y is a numeric vector and alpha is the significance level with a default value of .05. In the function,
   1. Subset the nonmissing values from y and call it z
   2. Display an error message if the number of nonmissing values is 1 (hint, use stop() function).
   3. Compute n, the number of observations in z
   4. Compute the mean and sd of z, say z.bar and z.sd
   5. Compute the one-sample t test statistics T=z.bar/(z.sd/sqrt(n))
   6. Compute p-value p=2\*Pr(t>|T|), where t has n-1 df.
   7. Compute 100(1-alpha)% CI:
   8. Return a list with all the results
9. Use y=rnorm(30) to generate 30 independent numbers from the Z distribution
10. Apply the function you wrote in Problem 8 on y
11. Use the R built-in function t.test on y and compare the results with the ones you produced using your own function one.t.test.