Week 1 Quiz

This ungraded Week 1 quiz is intended as a hands-on-lab to help you build your skills working with R data types and control structures. Solutions to all problems are immediately available, but you'll learn the material more *durably* if you attempt each problem before consulting its solution.

1. Create a vector that contains 20 numbers. (You may choose whatever numbers you like, but make sure there are some duplicates.)
2. Use R to convert the vector from question 1 into a character vector.
3. Use R to convert the vector from question 1 into a vector of factors.
4. Use R to show how many levels the vector in the previous question has.
5. Use R to create a vector that takes the vector from question 1 and performs on it the formula $3x^2 - 4x + 1$.
6. Create a named list. That is, create a list with several elements that are each able to be referenced by name.
7. Create a data frame with four columns – one each character, factor (with three levels), numeric, and date. Your data frame should have at least 10 observations (rows).
8. Illustrate how to add a row with a value for the factor column that isn't already in the list of levels. (Note: You do not need to accomplish this with a single line of code.)
9. Show the code that would read in a CSV file called **temperatures.csv** from the current working directory.
10. Use a loop to calculate the final balance, rounded to the nearest cent, in an account that earns 3.24% interest compounded monthly after six years if the original balance is $1,500.
11. Create a numeric vector of length 20 and then write code to calculate the sum of every third element of the vector you have created.
12. Use a for loop to calculate $\sum_{i=1}^{10} x^i$ for the value $x = 2$.
13. Use a while loop to accomplish the same task as in the previous exercise.
14. Solve the problem from the previous two exercises without using a loop.