

STAT 540: Homework 1

1. Create a regularly-spaced sequence of 11 values from 0 to π using first `length`, and then `by`. **R** has a function for π named, curiously enough, `pi`; use that rather than a numerical approximation.
2. Load the data set `airquality`. What type of object is it? Does it have default names/row names? Identify each of the variables in `airquality`; what types of objects are they? Create a data frame consisting of the last 3 variables in `airquality` (Graduate students should do this by excluding variables rather than including variables). Attach to the data frame, and display the 11th component for the third variable; now detach the data frame and display the 11th component again (*Do not use the matrix notation `[11,3]` to display the component*). Convert the last two variables, `Month` and `Day`, to factors.
3. For each part below, give a single R command to complete the goal. Do not use `c()`.
 - (a) Create a vector called `seqvec` that repeats the sequence 1 through 6 five times. (Grad students: work with the sequence 1, 3, 6, 10, 15, 21 instead)
 - (b) Create a 5-row, 6-column matrix from `seqvec`; each row should contain the sequence `seqvec`.
 - (c) Complete the two tasks above in a single step.
4. The Fire Response data on the website simulates the response time (in minutes) for tractor units to reach fires on non-federal lands in South Carolina. The districts are row names. The variables include the readiness level of each district (1=low, 2=medium, 3=high), the elapsed time to contact the dispatch office, the elapsed time for the dispatcher to contact a tractor unit, and the elapsed time for a tractor unit to reach the scene of a fire. Graduate students should use the Fire Response Grad data set.
 - (a) Read in the data set as a data frame; you may need `row.names=NULL` to read it in. (Grad students—make sure to read in both `.` and `NA` as missing value codes using `na.strings`)
 - (b) Change the name of the District column so that it reads as “District”.
 - (c) Extract rows 4, 11, 12, and 15—the rows for the Midlands and save them in a data frame called `Midlands` (We’ll soon learn a more efficient way of doing this). Display the new data frame.