Data 413: Classwork/Lab 1

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## In three or four sentences, explain why constructing a Function in order to execute tasks, is beneficial or advantageous

Constructing a function in order to execute tasks is beneficial/advantageous because it helps you to decrease the amount of input or computational errors that you would have in your code due to repetitive calculations. Functions help you to reuse your code for different inputs, which helps you to properly organize and simplify your code making it easier to follow. Finally, functions allows you to solve complex problems to simpler code.

# Write a function (using r code and structure demonstrated in class) to calculate a z score for a given observed value, a mean, and a standard deviation value. And then use your function to find a z score for the following problem.

Observed value = 25.77, mean = 23.54, standard deviation = 2.442

z\_score <- function(ob, mean, sd){  
 (ob - mean)/sd  
}  
  
print(paste("The z score is", z\_score(25.77, 23.54, 2.442)))

## [1] "The z score is 0.913185913185913"

## Write a function (using r code and the structure demonstrated in class) to calculate the natural log of a number multiplied by the common log of the same number divided by the cube root of a given prime number.Use your function to find the answer if the number to be used for both log expressions is 32 and the given prime number is 11.

## Also use R code to round your answer to the nearest tenth

natural\_Common <- function(num, prime){  
 V = ((log(num)\*log10(num))/(prime^(1/3)))  
 return(round(V, digits = 1))  
}  
  
natural\_Common(32, 11)

## [1] 2.3

#Use and show R coding to calculate the standard deviation for each variable of the data table mtcars using the “Special For Loop Method” demonstrated in the class notes

mtcars

## mpg cyl disp hp drat wt qsec vs am gear carb  
## Mazda RX4 21.0 6 160.0 110 3.90 2.620 16.46 0 1 4 4  
## Mazda RX4 Wag 21.0 6 160.0 110 3.90 2.875 17.02 0 1 4 4  
## Datsun 710 22.8 4 108.0 93 3.85 2.320 18.61 1 1 4 1  
## Hornet 4 Drive 21.4 6 258.0 110 3.08 3.215 19.44 1 0 3 1  
## Hornet Sportabout 18.7 8 360.0 175 3.15 3.440 17.02 0 0 3 2  
## Valiant 18.1 6 225.0 105 2.76 3.460 20.22 1 0 3 1  
## Duster 360 14.3 8 360.0 245 3.21 3.570 15.84 0 0 3 4  
## Merc 240D 24.4 4 146.7 62 3.69 3.190 20.00 1 0 4 2  
## Merc 230 22.8 4 140.8 95 3.92 3.150 22.90 1 0 4 2  
## Merc 280 19.2 6 167.6 123 3.92 3.440 18.30 1 0 4 4  
## Merc 280C 17.8 6 167.6 123 3.92 3.440 18.90 1 0 4 4  
## Merc 450SE 16.4 8 275.8 180 3.07 4.070 17.40 0 0 3 3  
## Merc 450SL 17.3 8 275.8 180 3.07 3.730 17.60 0 0 3 3  
## Merc 450SLC 15.2 8 275.8 180 3.07 3.780 18.00 0 0 3 3  
## Cadillac Fleetwood 10.4 8 472.0 205 2.93 5.250 17.98 0 0 3 4  
## Lincoln Continental 10.4 8 460.0 215 3.00 5.424 17.82 0 0 3 4  
## Chrysler Imperial 14.7 8 440.0 230 3.23 5.345 17.42 0 0 3 4  
## Fiat 128 32.4 4 78.7 66 4.08 2.200 19.47 1 1 4 1  
## Honda Civic 30.4 4 75.7 52 4.93 1.615 18.52 1 1 4 2  
## Toyota Corolla 33.9 4 71.1 65 4.22 1.835 19.90 1 1 4 1  
## Toyota Corona 21.5 4 120.1 97 3.70 2.465 20.01 1 0 3 1  
## Dodge Challenger 15.5 8 318.0 150 2.76 3.520 16.87 0 0 3 2  
## AMC Javelin 15.2 8 304.0 150 3.15 3.435 17.30 0 0 3 2  
## Camaro Z28 13.3 8 350.0 245 3.73 3.840 15.41 0 0 3 4  
## Pontiac Firebird 19.2 8 400.0 175 3.08 3.845 17.05 0 0 3 2  
## Fiat X1-9 27.3 4 79.0 66 4.08 1.935 18.90 1 1 4 1  
## Porsche 914-2 26.0 4 120.3 91 4.43 2.140 16.70 0 1 5 2  
## Lotus Europa 30.4 4 95.1 113 3.77 1.513 16.90 1 1 5 2  
## Ford Pantera L 15.8 8 351.0 264 4.22 3.170 14.50 0 1 5 4  
## Ferrari Dino 19.7 6 145.0 175 3.62 2.770 15.50 0 1 5 6  
## Maserati Bora 15.0 8 301.0 335 3.54 3.570 14.60 0 1 5 8  
## Volvo 142E 21.4 4 121.0 109 4.11 2.780 18.60 1 1 4 2

sd\_mtcars <- vector("double", ncol(mtcars)) # 1. output  
 for (i in seq\_along(mtcars)) { # 2. sequence  
 sd\_mtcars[[i]] <- sd(mtcars[[i]]) # 3. body  
 }  
  
sd\_mtcars

## [1] 6.0269481 1.7859216 123.9386938 68.5628685 0.5346787 0.9784574  
## [7] 1.7869432 0.5040161 0.4989909 0.7378041 1.6152000