Data 413: Homework 2

Frankie Tyndall

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## Vector Being Used

Vector1 <- (c( 10, 19, 121, 83, 63, 7, 77, 61, 51, 97, 123, 41))  
Vector1

## [1] 10 19 121 83 63 7 77 61 51 97 123 41

## For the vector given above, use and show two methods of R coding to extract the first element and the last element.

print("method 1")

## [1] "method 1"

Vector1[c(1,12)]

## [1] 10 41

print("method 2")

## [1] "method 2"

Vector1[-c(2,3,4,5,6,7,8,9,10,11)]

## [1] 10 41

## For the vector given above, use and show two methods of R coding to extract all of the elements that are less than 60.

print("method 1")

## [1] "method 1"

Vector1[Vector1 < 60]

## [1] 10 19 7 51 41

print("method 2")

## [1] "method 2"

Vector1[!Vector1 > 60]

## [1] 10 19 7 51 41

## For the vector given above, use and show two methods of R coding to extract all numbers that are not divisible by 2 or 3.

print("method 1")

## [1] "method 1"

Vector1[!Vector1 %% 2 == 0 & !Vector1 %%3 == 0]

## [1] 19 121 83 7 77 61 97 41

print("method 2")

## [1] "method 2"

for (i in Vector1){  
 if(i%% 2 != 0 & i%% 3 != 0){  
 print(i)  
 }  
   
}

## [1] 19  
## [1] 121  
## [1] 83  
## [1] 7  
## [1] 77  
## [1] 61  
## [1] 97  
## [1] 41

## My list

myList <- list(TRUE, 12.35,"pear", 48, c = 3:8, list(23, "team"))  
myList

## [[1]]  
## [1] TRUE  
##   
## [[2]]  
## [1] 12.35  
##   
## [[3]]  
## [1] "pear"  
##   
## [[4]]  
## [1] 48  
##   
## $c  
## [1] 3 4 5 6 7 8  
##   
## [[6]]  
## [[6]][[1]]  
## [1] 23  
##   
## [[6]][[2]]  
## [1] "team"

## Use and show two R coding methods to confirm that myList does not have missing values

print("method 1")

## [1] "method 1"

list(NA) %in% myList # NA is not in the List, so the output is False

## [1] FALSE

list(48) %in% myList # 48 is in the List, so the output is True

## [1] TRUE

list(12.35) %in% myList # 12.35 is in the List, so the output is True

## [1] TRUE

list("pear") %in% myList # "pear" is in the List, so the output is True

## [1] TRUE

list("CAT") %in% myList # "CAT" is not in the list, so the output is FALSE

## [1] FALSE

print("method 2")

## [1] "method 2"

anyNA(myList, recursive = TRUE)

## [1] FALSE

# Will return False cause there are no NA in myList

## For the list given above, use and show R coding to confirm that “pear” is a character element.

print("method 1")

## [1] "method 1"

str(myList[[3]])

## chr "pear"

print("method 2")

## [1] "method 2"

myList[myList == "pear"]

## [[1]]  
## [1] "pear"

## For the list given above, use and show R coding to extract the first three elements of the list.

str(myList[c(1,2,3)])

## List of 3  
## $ : logi TRUE  
## $ : num 12.3  
## $ : chr "pear"

## Use the $ operator to extract the element “pear” from your list. Be sure to use and show required R code to produce the requested output.

myList <- list(TRUE, 12.35, pe = "pear", 48, c = 3:8, list(23, "team"))  
myList$pe

## [1] "pear"

## Use and show R code to write a function to solve the following quadratic equations by using the quadratic formula. (all equations have two real number solutions)

quadratic\_formula <- function(a,b,c){  
 x = (-1\*b + ((b^(2) - 4\*a\*c))^0.5)/(2\*a)  
 s = (-1\*b - ((b^(2) - 4\*a\*c))^0.5)/(2\*a)  
 return(c(x,s))  
}  
quadratic\_formula(1,-3, -28)

## [1] 7 -4

quadratic\_formula(1,1,-30)

## [1] 5 -6

quadratic\_formula(3,14,8)

## [1] -0.6666667 -4.0000000

quadratic\_formula(2,11,-6)

## [1] 0.5 -6.0

## In your book (towards the end of chapter 16) a special set of vectors are defined as Augmented Vectors. One such augmented vector is a Tibble. Use and show R code that will produce the Tibble shown below. Do not simply type or copy and paste. You must show and use R coding that will output the tibble

tribble( ~x, ~y, ~Z,   
 1, 10, 5,   
 2, 9, 4.5,   
 3, 8, 4,   
 4, 7, 3.5,   
 5, 6, 3,   
 6, 5, 2.5,   
 7, 4, 2,  
 8, 3, 1.5,  
 9, 2, 1,  
 10, 1, 0.5, ) -> xyz\_tibble  
  
xyz\_tibble

## # A tibble: 10 × 3  
## x y Z  
## <dbl> <dbl> <dbl>  
## 1 1 10 5   
## 2 2 9 4.5  
## 3 3 8 4   
## 4 4 7 3.5  
## 5 5 6 3   
## 6 6 5 2.5  
## 7 7 4 2   
## 8 8 3 1.5  
## 9 9 2 1   
## 10 10 1 0.5

## In statistics, the Interquartile Range is the difference between Q3 and Q1. Now show and use map function coding to find the Interquartile Range for each column of the tibble from number 9.

map\_dbl(xyz\_tibble, IQR)

## x y Z   
## 4.50 4.50 2.25