Chapter 13 - Iterating with purrr

Michael Beebe

## 1. map

Create a list called myList. in this list store:  
- A matrix of the numbers 1-10 in 2 rows  
- The even numbers from 0-10  
- The odd numbers from 1-9  
- A matrix of the numbers from 1-9 in 3 rows

myList <- list(  
 matrix(data = 1:10, nrow = 2),  
 c(2, 4, 5, 6, 8, 10),  
 c(1, 3, 5, 7, 9),  
 matrix(data = 1:9, nrow = 3)  
)  
  
myList

## [[1]]  
## [,1] [,2] [,3] [,4] [,5]  
## [1,] 1 3 5 7 9  
## [2,] 2 4 6 8 10  
##   
## [[2]]  
## [1] 2 4 5 6 8 10  
##   
## [[3]]  
## [1] 1 3 5 7 9  
##   
## [[4]]  
## [,1] [,2] [,3]  
## [1,] 1 4 7  
## [2,] 2 5 8  
## [3,] 3 6 9

Map the mean and sum functions to your list

map(myList, mean)

## [[1]]  
## [1] 5.5  
##   
## [[2]]  
## [1] 5.833333  
##   
## [[3]]  
## [1] 5  
##   
## [[4]]  
## [1] 5

map(myList, sum)

## [[1]]  
## [1] 55  
##   
## [[2]]  
## [1] 35  
##   
## [[3]]  
## [1] 25  
##   
## [[4]]  
## [1] 45

Use the identical function to determine if map and lapply are the same when applied to myList

lapply(myList, mean)

## [[1]]  
## [1] 5.5  
##   
## [[2]]  
## [1] 5.833333  
##   
## [[3]]  
## [1] 5  
##   
## [[4]]  
## [1] 5

lapply(myList, sum)

## [[1]]  
## [1] 55  
##   
## [[2]]  
## [1] 35  
##   
## [[3]]  
## [1] 25  
##   
## [[4]]  
## [1] 45

## 2. map with Specified Types

Using your list - myList - find the following:  
- Use map\_int to find number of rows or length of each list element

map\_int(myList, length)

## [1] 10 6 5 9

* Use map\_dbl to find the standard deviation

map\_dbl(myList, sd)

## [1] 3.027650 2.857738 3.162278 2.738613

* Use map\_chr to find the class of each element in your list

map\_chr(myList, typeof)

## [1] "integer" "double" "double" "integer"

* Use map\_lgl to determine if the number of rows in each element of your list is < 3

check <- function(x) is.list(nrow(x)) < 3  
map\_lgl(myList, check)

## [1] TRUE TRUE TRUE TRUE

* Create the data frame and list on page 184 of your text. Use map\_df to call the function with the list of lengths

buildDF <- function(x) {  
 data.frame(A=1:x, B=x:1)  
}  
  
listOfLengths <- list(3, 4, 1, 5)  
  
listOfLengths %>%  
 map(buildDF)

## [[1]]  
## A B  
## 1 1 3  
## 2 2 2  
## 3 3 1  
##   
## [[2]]  
## A B  
## 1 1 4  
## 2 2 3  
## 3 3 2  
## 4 4 1  
##   
## [[3]]  
## A B  
## 1 1 1  
##   
## [[4]]  
## A B  
## 1 1 5  
## 2 2 4  
## 3 3 3  
## 4 4 2  
## 5 5 1

## 3. Iterating over a data.frame

Use the mtcars built in data set  
Find the mean of all of the numeric data in the dataset

mtcars %>%  
 map(mean)

## $mpg  
## [1] 20.09062  
##   
## $cyl  
## [1] 6.1875  
##   
## $disp  
## [1] 230.7219  
##   
## $hp  
## [1] 146.6875  
##   
## $drat  
## [1] 3.596563  
##   
## $wt  
## [1] 3.21725  
##   
## $qsec  
## [1] 17.84875  
##   
## $vs  
## [1] 0.4375  
##   
## $am  
## [1] 0.40625  
##   
## $gear  
## [1] 3.6875  
##   
## $carb  
## [1] 2.8125

Find the standard deviation of all of the numeric data in the dataset

mtcars %>%  
 map(sd)

## $mpg  
## [1] 6.026948  
##   
## $cyl  
## [1] 1.785922  
##   
## $disp  
## [1] 123.9387  
##   
## $hp  
## [1] 68.56287  
##   
## $drat  
## [1] 0.5346787  
##   
## $wt  
## [1] 0.9784574  
##   
## $qsec  
## [1] 1.786943  
##   
## $vs  
## [1] 0.5040161  
##   
## $am  
## [1] 0.4989909  
##   
## $gear  
## [1] 0.7378041  
##   
## $carb  
## [1] 1.6152