hw 2

data(iris)  
head(iris)

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 5.1 3.5 1.4 0.2 setosa  
## 2 4.9 3.0 1.4 0.2 setosa  
## 3 4.7 3.2 1.3 0.2 setosa  
## 4 4.6 3.1 1.5 0.2 setosa  
## 5 5.0 3.6 1.4 0.2 setosa  
## 6 5.4 3.9 1.7 0.4 setosa

sp\_ids = unique(iris$Species)  
  
output = matrix(0, nrow=length(sp\_ids), ncol=ncol(iris)-1)  
rownames(output) = sp\_ids  
colnames(output) = names(iris[ , -ncol(iris)])  
  
for(i in seq\_along(sp\_ids)) {  
 iris\_sp = subset(iris, subset=Species == sp\_ids[i], select=-Species)  
 for(j in 1:(ncol(iris\_sp))) {  
 x = 0  
 y = 0  
 if (nrow(iris\_sp) > 0) {  
 for(k in 1:nrow(iris\_sp)) {  
 x = x + iris\_sp[k, j]  
 y = y + 1  
 }  
 output[i, j] = x / y   
 }  
 }  
}  
output

## Sepal.Length Sepal.Width Petal.Length Petal.Width  
## setosa 5.006 3.428 1.462 0.246  
## versicolor 5.936 2.770 4.260 1.326  
## virginica 6.588 2.974 5.552 2.026

1. Output is mean value of each characteristic for each species.
2. Loop through species names, form subset for each species Loop through each column in subset If row number is greater than zero loop through column and calculate mean of column
3. X could be renamed sumcharacteristic, y could be renamed ntotal, and output could be renamed averagecharacteristic or meancharacteristic.
4. Using a mean function instead of the third nested for loop would be more efficient.

y = 0  
x = 1:10  
  
for(i in x){  
 y[i] = sum(x[1:i])  
 print(y)  
}

## [1] 1  
## [1] 1 3  
## [1] 1 3 6  
## [1] 1 3 6 10  
## [1] 1 3 6 10 15  
## [1] 1 3 6 10 15 21  
## [1] 1 3 6 10 15 21 28  
## [1] 1 3 6 10 15 21 28 36  
## [1] 1 3 6 10 15 21 28 36 45  
## [1] 1 3 6 10 15 21 28 36 45 55

y = 0  
x = 1:10  
  
for(i in x){  
 y[i] = sum(x[1:i])  
 if(y[i]<=10){  
 print(y)  
 }  
 else{  
 print(NA)  
 }  
}

## [1] 1  
## [1] 1 3  
## [1] 1 3 6  
## [1] 1 3 6 10  
## [1] NA  
## [1] NA  
## [1] NA  
## [1] NA  
## [1] NA  
## [1] NA

sum\_1 = function(x) {  
 output = NULL  
 for(i in seq\_along(x)) {  
 y[i] = sum(x[1:i])  
 if(y[i]<=10) {  
 print(y)  
 }  
 else{  
 print(NA)  
 }  
 }  
 return(output)  
 }  
output

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