Week-6: Code-along

Annette

2023-09-17

knitr::opts\_chunk$set(echo = TRUE)

# II. Code to edit and execute using the Code-along-6.Rmd file

## A. for loop

### 1. Simple for loop (Slide #6)

for (x in c(3, 6, 9)) {  
 print(x)  
}

## [1] 3  
## [1] 6  
## [1] 9

### 2. for loops structure (Slide #7)

for (x in 1:8) {print(x)}

## [1] 1  
## [1] 2  
## [1] 3  
## [1] 4  
## [1] 5  
## [1] 6  
## [1] 7  
## [1] 8

for (x in 1:8)  
{y <- seq(from=100, to=200, by=5)  
print(y[x])}

## [1] 100  
## [1] 105  
## [1] 110  
## [1] 115  
## [1] 120  
## [1] 125  
## [1] 130  
## [1] 135

### 3. Example: find sample means (Slide #9)

sample\_sizes <- c(5, 10, 15, 20, 25000)  
  
sample\_means <- double(length(sample\_sizes))  
  
for (i in seq\_along(sample\_sizes)) {  
 sample\_means[[i]] <- mean(rnorm(sample\_sizes[[i]]))  
}  
  
sample\_means

## [1] -0.109335858 0.714445765 0.231756020 -0.121306350 0.007322002

### 4. Alternate ways to pre-allocate space (Slide #12)

sample\_means <- rep(0, length(sample\_sizes))  
sample\_means

## [1] 0 0 0 0 0

data\_list <- vector("list", length =5)  
data\_list

## [[1]]  
## NULL  
##   
## [[2]]  
## NULL  
##   
## [[3]]  
## NULL  
##   
## [[4]]  
## NULL  
##   
## [[5]]  
## NULL

### 5. Review: Vectorized operations (Slide #18)

a <- 7:11  
b <- 8:12  
  
out <- rep(0L ,5)  
for (i in seq\_along(a)) {  
 out[i] <- a[i] + b[i]  
}  
  
out

## [1] 15 17 19 21 23

a <- 7:11  
b <- 8:12  
out <- a + b  
out

## [1] 15 17 19 21 23

## B. Functionals

### 6. for loops vs Functionals (Slides #23 and #24)

sample\_sizes <- c(5, 10, 15, 20, 25000)  
  
sample\_summary <- function(sample\_sizes, fun) {  
  
out <- vector("double", length(sample\_sizes))  
for (i in seq\_along(sample\_sizes)) {  
 out[i] <- fun(rnorm(sample\_sizes[i]))  
 }  
return(out)  
}

sample\_summary(sample\_sizes,mean)

## [1] -0.421971237 -0.588724964 -0.221535598 0.068624333 -0.001418015

sample\_summary(sample\_sizes, median)

## [1] 0.6713089339 0.1614167733 0.0006341392 -0.2390643662 0.0075166562

sample\_summary(sample\_sizes,sd)

## [1] 1.0808812 0.5643126 0.8550431 1.3157016 0.9981776

## C. while loop

### 7. while loop (Slides #27)

for(i in 1:5) {  
 print(i)  
}

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

i <- 1  
while (i<=5) {  
 print(i)  
 i <- i + 1  
}

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