Lab2.R

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#Run the following code to create a large vector containing randomly generated integers between 1 and 12:  
n = 12345  
vec\_1 = sample(12, n, replace = TRUE)  
head(vec\_1)

## [1] 1 10 11 6 8 8

#Use a logical test operator to create a Boolean vector (called vec\_2) whose entries are TRUE if the corresponding entry in vec\_1 is 3 and FALSE otherwise.  
###Q1  
vec\_2 = c(vec\_1 == 3)  
#Self test: you can use vec\_2 to retrieve all of the 3 elements of vec\_1 using the following:  
#vec\_1[vec\_2]  
###Q2  
# the vector is very large, easy to lose track  
  
n = 12345  
vec\_1 = sample(12, n, replace = TRUE)  
head(vec\_1)

## [1] 1 7 6 11 11 5

length(vec\_1)

## [1] 12345

sum(vec\_1 == 3)

## [1] 1062

n = 10  
vec\_1 = sample(12, n, replace = TRUE)  
paste0("Sum of elements with value 3: ", sum(vec\_1 == 3))

## [1] "Sum of elements with value 3: 0"

###Q3  
#The numbers are randomly generated each time.  
###Q4  
#Number and order of 3 change each time. A logical test always makes the correct selection in a second.  
###Q5  
#By-hand subsetting is very time-consuming when data sets are large.  
#By-hand subsetting has more room for error.  
#You do not have any code to reuse or share.  
  
###Q6  
for (i in 1:10)  
{  
 print(paste0("This is loop iteration: ", i))  
}

## [1] "This is loop iteration: 1"  
## [1] "This is loop iteration: 2"  
## [1] "This is loop iteration: 3"  
## [1] "This is loop iteration: 4"  
## [1] "This is loop iteration: 5"  
## [1] "This is loop iteration: 6"  
## [1] "This is loop iteration: 7"  
## [1] "This is loop iteration: 8"  
## [1] "This is loop iteration: 9"  
## [1] "This is loop iteration: 10"

###Q7  
n <- 20  
for (i in 1:n)  
{  
 print(i)  
}

## [1] 1  
## [1] 2  
## [1] 3  
## [1] 4  
## [1] 5  
## [1] 6  
## [1] 7  
## [1] 8  
## [1] 9  
## [1] 10  
## [1] 11  
## [1] 12  
## [1] 13  
## [1] 14  
## [1] 15  
## [1] 16  
## [1] 17  
## [1] 18  
## [1] 19  
## [1] 20

###Q8  
#Create an integer variable, n, that holds the value 17.  
n = 17  
#Write code to create a vector called vec\_1 of length n. vec\_1 should contain [pseudo]randomly generated integers between 1 and 10.  
vec\_1 = sample(10, n, replace = TRUE) ##randomly generated integers between 1 and 10, length n (17)  
vec\_1

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

for (i in 1:n) #Iterates n times (once for each element of vec\_1)  
{  
 print(paste0("The element of vec\_1 at index ", i, " is ", vec\_1[i])) #Prints a message that includes the iteration number as well as the corresponding element of vec\_1  
}

## [1] "The element of vec\_1 at index 1 is 9"  
## [1] "The element of vec\_1 at index 2 is 1"  
## [1] "The element of vec\_1 at index 3 is 6"  
## [1] "The element of vec\_1 at index 4 is 9"  
## [1] "The element of vec\_1 at index 5 is 10"  
## [1] "The element of vec\_1 at index 6 is 3"  
## [1] "The element of vec\_1 at index 7 is 7"  
## [1] "The element of vec\_1 at index 8 is 2"  
## [1] "The element of vec\_1 at index 9 is 9"  
## [1] "The element of vec\_1 at index 10 is 5"  
## [1] "The element of vec\_1 at index 11 is 6"  
## [1] "The element of vec\_1 at index 12 is 3"  
## [1] "The element of vec\_1 at index 13 is 1"  
## [1] "The element of vec\_1 at index 14 is 4"  
## [1] "The element of vec\_1 at index 15 is 8"  
## [1] "The element of vec\_1 at index 16 is 8"  
## [1] "The element of vec\_1 at index 17 is 5"

###Q9  
create\_and\_print\_vec = function(n, min = 1, max = 10)  
{  
 vec = sample(min:max, n, replace = TRUE)   
 for (i in 1:n)   
 {print(paste0("The element at index ", i, " is ", vec[i]))  
 }  
}  
create\_and\_print\_vec(20, min = 1, max = 10)

## [1] "The element at index 1 is 9"  
## [1] "The element at index 2 is 9"  
## [1] "The element at index 3 is 9"  
## [1] "The element at index 4 is 6"  
## [1] "The element at index 5 is 9"  
## [1] "The element at index 6 is 5"  
## [1] "The element at index 7 is 1"  
## [1] "The element at index 8 is 6"  
## [1] "The element at index 9 is 5"  
## [1] "The element at index 10 is 2"  
## [1] "The element at index 11 is 1"  
## [1] "The element at index 12 is 8"  
## [1] "The element at index 13 is 6"  
## [1] "The element at index 14 is 6"  
## [1] "The element at index 15 is 7"  
## [1] "The element at index 16 is 8"  
## [1] "The element at index 17 is 5"  
## [1] "The element at index 18 is 5"  
## [1] "The element at index 19 is 9"  
## [1] "The element at index 20 is 2"

create\_and\_print\_vec(10, min = 100, max = 2000)

## [1] "The element at index 1 is 672"  
## [1] "The element at index 2 is 1155"  
## [1] "The element at index 3 is 1682"  
## [1] "The element at index 4 is 583"  
## [1] "The element at index 5 is 1069"  
## [1] "The element at index 6 is 1764"  
## [1] "The element at index 7 is 610"  
## [1] "The element at index 8 is 589"  
## [1] "The element at index 9 is 1592"  
## [1] "The element at index 10 is 1783"