LEARN MORE 365

Loops Lesson

Loops

> **Note**
>
> *Install and call the tidyverse package in order to access the "starwars" dataset used in this lesson.*

Loops

What is a loop?

In R, loops are control structures used to repeat a block of code multiple times until a certain condition is met. Loops are useful when you want to perform repetitive tasks or iterate over elements in a vector, list, or data frame.

Loops are best understood by looking at (and practicing) examples.

A simple example

In the example below, R will repeat the code found within the curly brackets `{ code }` five times; with each iteration the value of `i` will increase by one increment.

```
for(i in 1:5){
    print(starwars$name[i])
}
```

```
[1] "Luke Skywalker"
[1] "C-3PO"
[1] "R2-D2"
[1] "Darth Vader"
[1] "Leia Organa"
```

Instead of stating the number of iterations, we can use the output of a function to define the end point. We could use `nrow()` or `length()` as in the example below.

```
for(i in 1:length(starwars$height)){
    print(starwars$height[i])
}
```

```
[1] 172
[1] 167
[1] 96
[1] 202
[1] 150
[1] 178
[1] 165
[1] 97
[1] 183
[1] 182
[1] 188
[1] 180
[1] 228
[1] 180
[1] 173
[1] 175
[1] 170
[1] 180
[1] 66
[1] 170
[1] 183
[1] 200
[1] 190
[1] 177
[1] 175
[1] 180
[1] 150
[1] NA
[1] 88
[1] 160
[1] 193
[1] 191
[1] 170
[1] 196
[1] 224
```

```
[1] 206
[1] 183
[1] 137
[1] 112
[1] 183
[1] 163
[1] 175
[1] 180
[1] 178
[1] 94
[1] 122
[1] 163
[1] 188
[1] 198
[1] 196
[1] 171
[1] 184
[1] 188
[1] 264
[1] 188
[1] 196
[1] 185
[1] 157
[1] 183
[1] 183
[1] 170
[1] 166
[1] 165
[1] 193
[1] 191
[1] 183
[1] 168
[1] 198
[1] 229
[1] 213
[1] 167
[1] 79
[1] 96
[1] 193
[1] 191
[1] 178
[1] 216
[1] 234
```

```
[1] 188
[1] 178
[1] 206
[1] NA
[1] NA
[1] NA
[1] NA
[1] NA
[1] 165
```

Instead of printing the output of a loop, let's create an object that we can then use. In the example below, we've created an empty vector called "tallness" into which we'll input data points of height in cm divided by 100 to give us height in meters.

```
#create an empty vector
tallness <- vector(
    mode = "numeric",
    length = 5)

# Add data points to new vector
for(i in 1:5){
    tallness[i] <- starwars$height[i]/100
}

#Check new vector
tallness
```

```
[1] 1.72 1.67 0.96 2.02 1.50
```

Creating a break

A loop can be stopped if certain criteria are met. In the example below, when looping through the vector, R will `break` the loop as soon as `x` is equal to `"Darth Vader"`

```
for(x in starwars$name){
    print(x)
    if(x == "Darth Vader"){
        break
    }
    }
```

```
[1] "Luke Skywalker"
[1] "C-3PO"
[1] "R2-D2"
[1] "Darth Vader"
```

Next (skip a data point)

Data points can be skipped by stating a condition, which if met, will prompt the loop to go to the next iteration (and skip the current one). In the example below, C-3PO is skipped.

```
for(x in starwars$name){
    if(x == "C-3PO"){
        next
    }
    print(x)
    if(x == "Darth Vader"){
        break
    }
    }
```

```
[1] "Luke Skywalker"
[1] "R2-D2"
[1] "Darth Vader"
```

Concatenate and print

This is a lovely feature of looping that allows you to create a text output that is driven by differences in each iteration. The `cat()` function allows you to concatenate (or join together) elements of text. Take a look.

```
for(i in 1:5){
    cat("The height of", starwars$name[i], "is", tallness[i], "meters \n")
}
```

```
The height of Luke Skywalker is 1.72 meters
The height of C-3PO is 1.67 meters
The height of R2-D2 is 0.96 meters
The height of Darth Vader is 2.02 meters
The height of Leia Organa is 1.5 meters
```

Learn More 365

Share this cheat sheet with others

Unlock a wealth of FREE resources TODAY!

Click on the links below to enrich your knowledge in these topics:

- Statistics & Research Methods Resource Library
- R Programming & Data Visualization Resource Library
- Discover the Public Health & Epidemiology Resource Library

Explore video lessons on **Statistics & Research Methods, R Programming & Data Visualization Public Health & Epidemiology,** and more at Learn More 365!

Click **HERE** or scan the QR code below to start learning!