

Introduction to Functions in R

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Anatomy of an R Function

```
FunctionName <- function(arguments){  
  statements that do stuff,  
  these are R code  
}
```

see (*Google's R Style Guide* accessed November 16, 2014) for conventions on how to name functions. Function names should be verbs that describe what the function does. They should be capitalized and use *camel case*.

A Basic Example: Creating an Add Function

```
Add <- function(x, y) {  
  x + y  
}
```

```
Add(3, 4)
```

```
## [1] 7
```

Create a Division function

```
Division <- function(numerator, denominator=2) {  
  numerator/denominator  
}
```

Division Examples

```
Division(1, 2)
```

```
## [1] 0.5
```

```
Division(1)
```

```
## [1] 0.5
```

```
Division(2)
```

```
## [1] 1
```

Division Examples

```
Division(2, 4)
```

```
## [1] 0.5
```

```
Division(numerator=2, denominator=4)
```

```
## [1] 0.5
```

```
Division(denominator=4, numerator=2)
```

```
## [1] 0.5
```

```
Division(4, 2)
```

```
## [1] 2
```

Creating the Average Function

```
Average <- function(x) {  
  sum(x)/length(x)  
}
```

```
vec <- 0:100  
Average(vec)
```

```
## [1] 50
```

for Loops

```
x <- c(1, 4, 3, 1, 1)
```


for Loops

```
x <- c(1, 4, 3, 1, 1)
N <- 0
```

for Loops

```
x  <- c(1, 4, 3, 1, 1)
N  <- 0
  for (i in 1:5){
    N  <- N + x[i]
  }
```

for Loops

```
x  <- c(1, 4, 3, 1, 1)
N  <- 0
  for (i in 1:5){
    N  <- N + x[i]
  }
N
```

```
## [1] 10
```

Average Revisited | with for loop

```
Average <- function(x) {  
  N <- 0  
  for (i in 1:length(x)){  
    N <- N + x[i]  
  }  
  avg <- N/length(x)  
  return(avg)  
}
```

Average Revisited | with for loop

```
Average <- function(x) {  
  N <- 0  
  for (i in 1:length(x)){  
    N <- N + x[i]  
  }  
  avg <- N/length(x)  
  return(avg)  
}
```

Average Function Compared to base::mean Function

```
x <- 0:100  
Average(x)
```

```
## [1] 50
```

```
mean(x)
```

```
## [1] 50
```

Average returning list

```
Average <- function(x) {  
  N <- 0  
  for (i in 1:length(x)){  
    N <- N + x[i]  
  }  
  avg <- N/length(x)  
  
  return(list(sum.x=N, average=avg))  
}
```

```
Average(x)
```

```
## $sum.x  
## [1] 5050  
##  
## $average  
## [1] 50
```

References

Google's R Style Guide. accessed November 16, 2014.

<https://google-styleguide.googlecode.com/svn/trunk/Rguide.xml>.