PROG102: Functions

Writing your own functions in R

MARINCS 100B | Intro to Marine Data Science | Winter 2025

Key concepts

Easy to read

Reusable

Syntax

Demo in R

Recap

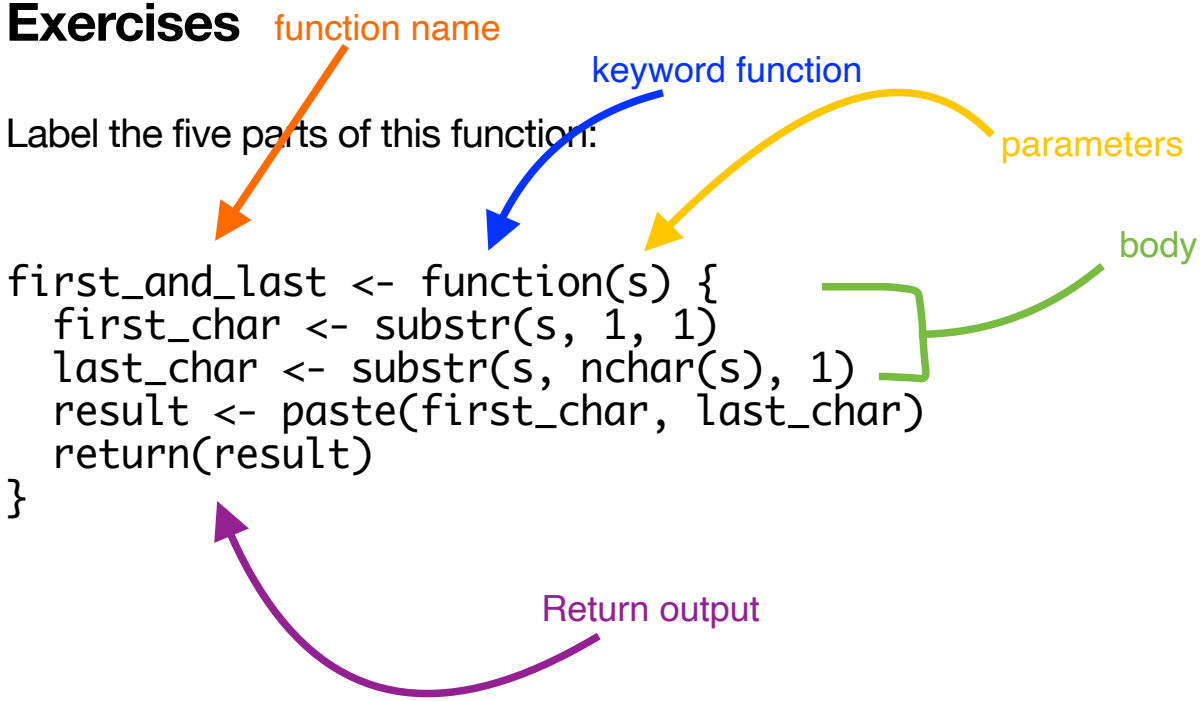
New vocabulary and lingering questions

New vocabulary

Lingering questions

Exercises

Label the five parts of this function:



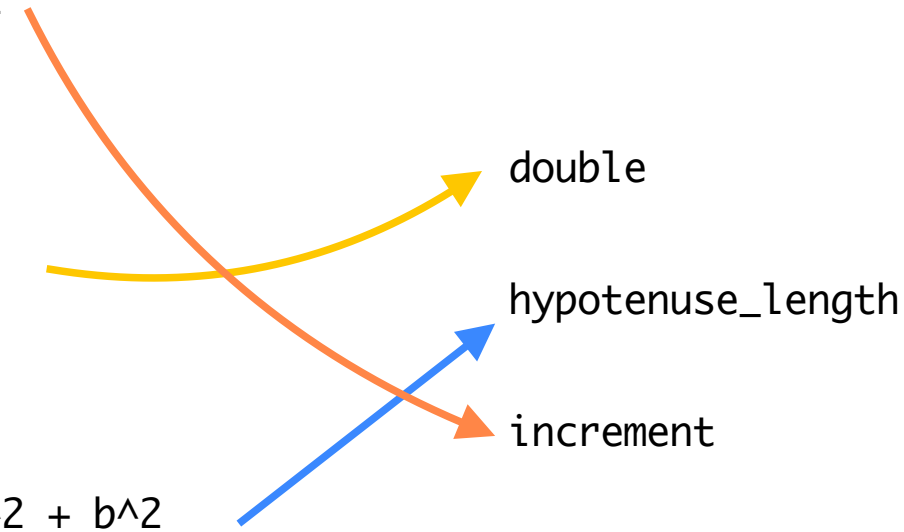
Exercises

Match the function bodies on the left with the name that describes what they're doing on the right.

```
function(x) {
  result <- x + 1
  return(result)
}
```

```
function(a) {
  result <- a * 2
  return(result)
}
```

```
function(a, b) {
  c_squared <- a^2 + b^2
  result <- sqrt(c_squared)
  return(result)
}
```



```
double
```

```
hypotenuse_length
```

```
increment
```

Exercises

Write a function that turns a vector into a palindrome. For example, it should turn 1 2 3 into 1 2 3 3 2 1. Hint: you'll have to use a function called `rev()`. Choose a short but descriptive name for your function.

PROG102: Functions

How functions execute

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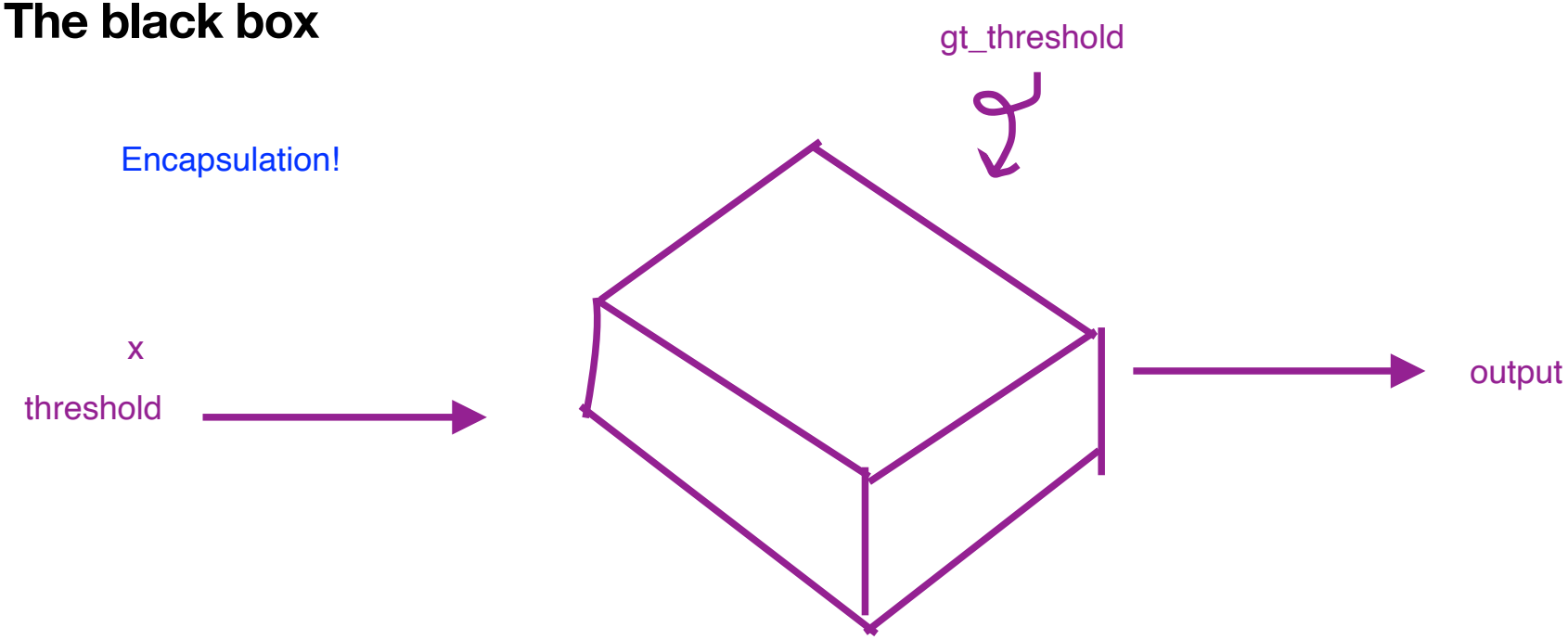
Key concepts

The black box

Encapsulation!



Demo in R

Recap

New vocabulary and lingering questions

New vocabulary

Lingering questions

Exercises

- What value does the following code yield?

  It yields the mass of a fish as a function of additional mass due to growth at a temperature

- How could you change `fish_mass` so the code yields 12 instead?

  Change fish_mass to 6

- How could you change the body of the function so the code yields 12?

  Have an addition of 3 instead of 2 during growth

```
fish_mass <- 5
temperature <- 20
fish_growth <- function(mass, temp) {
  growth <- 2 + 0.2 * temp
  mass <- mass + growth
  return(mass)
}
fish_growth(fish_mass, temperature)
```

Exercises

In your own words, why does running this code generate an error?

```
calc_volume <- function(height, width, depth) {
  area <- height * width
  volume <- area * depth
  return(volume)
}
vol <- calc_volume(3, 5, 1)
area
```

See RStudio

PROG102: Functions

Default and named parameters

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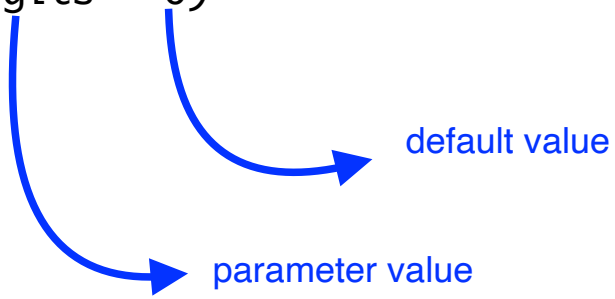
Key concepts

Default and named parameters

```
round(x, digits = 0)
```



round(pi) —> 3
round(pi, 0) —> 3
round(digits=0, pi) —> 3

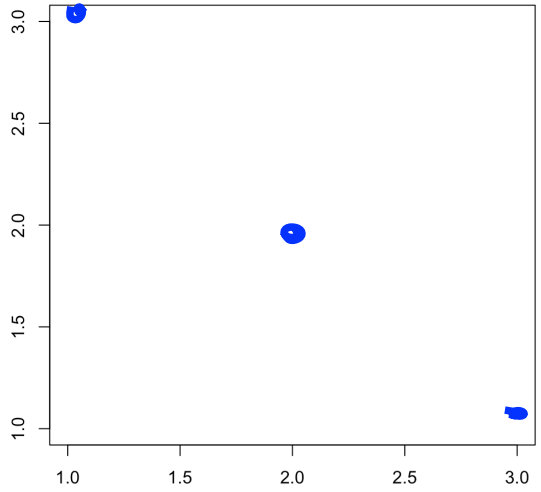
use the default
“by position”

Long parameter lists

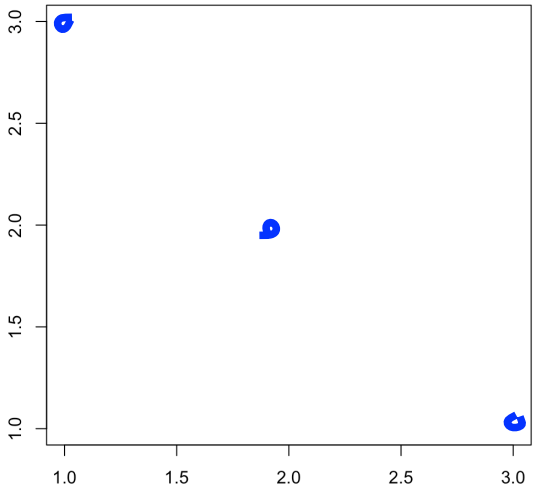
```
plot(x, y = NULL, type = "p",  xlim = NULL, ylim = NULL,
     log = "", main = NULL, sub = NULL, xlab = NULL, ylab = NULL,
     ann = par("ann"), axes = TRUE, frame.plot = axes,
     panel.first = NULL, panel.last = NULL, asp = NA,
     xgap.axis = NA, ygap.axis = NA,
     ...)
```

```
plot(c(1, 2, 3), c(3, 2, 1))
```

c(1, 2, 3)




```
plot(c(1, 2, 3), c(3, 2, 1),
     xlab = "x", ylab = "y")
```



Demo in R

skip

Triple dots

```
max(..., na.rm = FALSE)
paste(..., sep = " ", collapse = NULL, recycle0 = FALSE)
```

Recap

New vocabulary and lingering questions

New vocabulary

Lingering questions

Exercises

R represents *missing* data with the value NA. Say you're doing an experiment and you miss the second observation. In R you can write that as `c(1, NA, 3, 4)`.

Most summary functions, like `mean()`, `max()`, and `median()`, have a parameter called `na.rm`. What does this parameter do? What is its default value? How would you get the maximum value of the vector `c(1, NA, 3, 4)`?

The na.rm parameter removes missing values like NA.
I think the default value is 0.

To get the maximum value of the vector:

```
bits <- c(1, NA, 3, 4)
max(bits, na.rm = NA)
```