Debugging

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Something's Wrong!

Indications that something's not right

- `message`: A generic notification/diagnostic message produced by the `message` function; execution of the function continues

- `warning`: An indication that something is wrong but not necessarily fatal; execution of the function continues; generated by the `warning` function

- `error`: An indication that a fatal problem has occurred; execution stops; produced by the `stop` function

- `condition`: A generic concept for indicating that something unexpected can occur; programmers can create their own conditions

Something's Wrong!

Warning

```
log(-1)
```

```
## Warning: NaNs produced
```

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

Something's Wrong

```
printmessage <- function(x) {
        if(x > 0)
                print("x is greater than zero")
        else
                print("x is less than or equal to zero")
        invisible(x)

}
```

Something's Wrong

```r
printmessage <- function(x) {
    if (x > 0)
        print("x is greater than zero") else print("x is less than or equal to zero")
    invisible(x)
}
printmessage(1)
```

```
## [1] "x is greater than zero"
```

```r
printmessage(NA)
```

```
## Error: missing value where TRUE/FALSE needed
```

Something's Wrong!

```
printmessage2 <- function(x) {
        if(is.na(x))
                print("x is a missing value!")
        else if(x > 0)
                print("x is greater than zero")
        else
                print("x is less than or equal to zero")
        invisible(x)
}
```

Something's Wrong!

```r
printmessage2 <- function(x) {
    if (is.na(x))
        print("x is a missing value!") else if (x > 0)
        print("x is greater than zero") else print("x is less than or equal to zero")
    invisible(x)
}
x <- log(-1)
```

```
## Warning: NaNs produced
```

```r
printmessage2(x)
```

```
## [1] "x is a missing value!"
```

Something's Wrong!

How do you know that something is wrong with your function?

- What was your input? How did you call the function?

- What were you expecting? Output, messages, other results?

- What did you get?

- How does what you get differ from what you were expecting?

- Were your expectations correct in the first place?

- Can you reproduce the problem (exactly)?