

Code Sleuth

Defining functions

Inference

Code example	Output
<pre>initialize_reef <- function() { reef <- matrix(0, nrow = 5, ncol = 5) return(reef) } initialize_reef()</pre>	<pre> [,1] [,2] [,3] [,4] [,5] [1,] 0 0 0 0 0 [2,] 0 0 0 0 0 [3,] 0 0 0 0 0 [4,] 0 0 0 0 0 [5,] 0 0 0 0 0</pre>
<pre>initialize_reef <- function(reef_size) { reef <- matrix(0, nrow = reef_size, ncol = reef_size) return(reef) } initialize_reef(3)</pre>	<pre> [,1] [,2] [,3] [1,] 0 0 0 [2,] 0 0 0 [3,] 0 0 0</pre>
<pre>initialize_reef <- function(reef_size, fill) { reef <- matrix(fill, nrow = reef_size, ncol = reef_size) return(reef) } initialize_reef(3, -1)</pre>	<pre> [,1] [,2] [,3] [1,] -1 -1 -1 [2,] -1 -1 -1 [3,] -1 -1 -1</pre>

Functions take inputs and return outputs.

How many inputs and outputs does each version of initialize_reef above have?

What function is associated with returning output from a function?

Where does the function definition name its inputs?

Prediction

What will be the output of the following expressions?

Code example	Output
<pre>cell_to_row <- function(cell_label) { row <- (cell_label - 1) %% 5 + 1 return(row) } cell_to_row(1) cell_to_row(6)</pre>	
<pre>cell_to_row <- function(cell_label, reef_size) { row <- (cell_label - 1) %% reef_size + 1 return(row) } cell_to_row(1, 3) cell_to_row(6, 3)</pre>	

Function parameters

Inference

For these examples, assume the following definition:

```
initialize_reef <- function(reef_size, fill) {  
  reef <- matrix(fill, nrow = reef_size, ncol = reef_size)  
  return(reef)  
}
```

Code example	Output
<code>initialize_reef(2, FALSE)</code>	<pre> [,1] [,2] [1,] FALSE FALSE [2,] FALSE FALSE</pre>
<code>initialize_reef(reef_size = 2, fill = FALSE)</code>	<pre> [,1] [,2] [1,] FALSE FALSE [2,] FALSE FALSE</pre>
<code>initialize_reef(fill = FALSE, reef_size = 2)</code>	<pre> [,1] [,2] [1,] FALSE FALSE [2,] FALSE FALSE</pre>

In each of the examples above, what *parameter* takes on the value 2?

What *parameter* takes on the value FALSE?

How do *parameters* match inputs when they're unnamed?

How do *parameters* match inputs when they're named?

Prediction

What will be the output of the following expressions? For these examples, assume the following definition:

```
coral_fate <- function(roll, mortality_threshold, growth_threshold) {  
  if (roll <= mortality_threshold) {  
    fate <- "death :("  
  } else if (roll >= growth_threshold) {  
    fate <- "growth :)"  
  } else {  
    fate <- "survival :|"  
  }  
  return(fate)  
}
```

Code example	Output
<code>coral_fate(roll = 2, mortality_threshold = 3, growth_threshold = 7)</code>	
<code>coral_fate(11, 8, 10)</code>	
<code>coral_fate(growth_threshold = 8, mortality_threshold = 0, roll = 3)</code>	
<code>coral_fate(6, mortality_threshold = 4, growth_threshold = 6)</code>	
<code>coral_fate(12, growth_threshold = 12, mortality_threshold = 5)</code>	