

[301] Using Functions

Tyler Caraza-Harter

Learning Objectives Today

How to call functions

- input/output

Modules:

- import styles
- attribute operator (the ".")
- math module

Inspection:

- discover functions in a module
- learn what function does

make a battleship game!

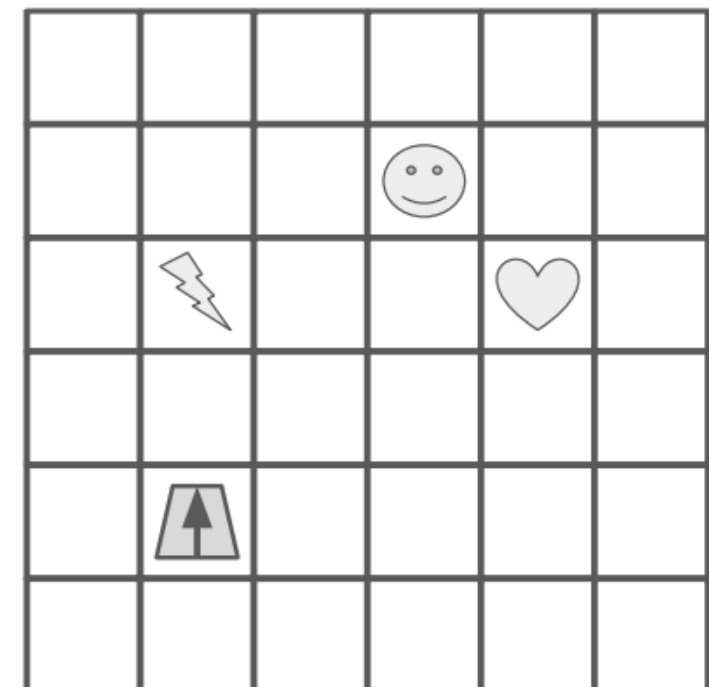
Main Code:

1. Put 2 in the “moves” box
2. Perform the steps under “Move Code”, then continue to step 3
3. Rotate the robot 90 degrees to the right (so arrow points to right)
4. Put 3 in the “moves” box
5. Perform the steps under “Move Code”, then continue to step 6
6. Whatever symbol the robot is sitting on, write that symbol in the “resut” box

Move Code:

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- B. Move the robot forward one square, in the direction the arrow is pointing
- C. Decrease the value in “moves” by one
- D. Go back to step A

**Functions are like “mini programs”,
as in our robot worksheet problem**



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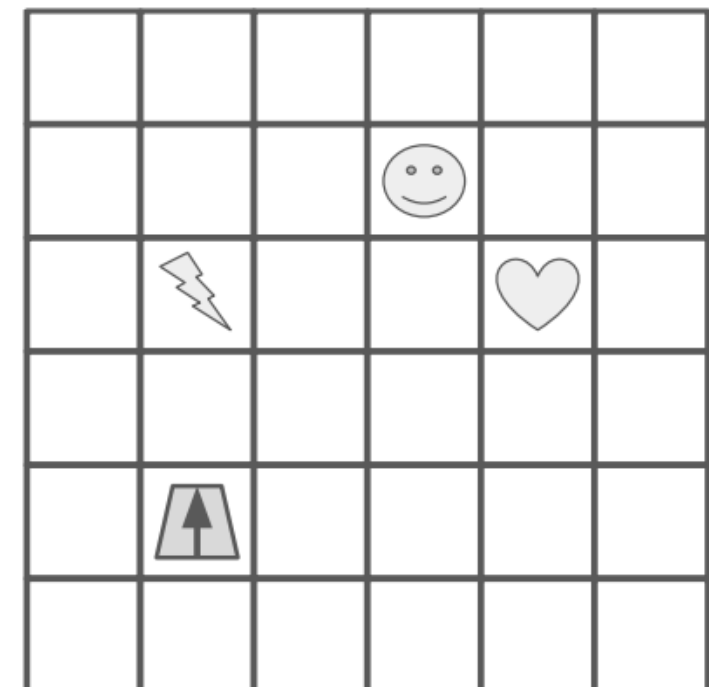
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“Move Code” is a function

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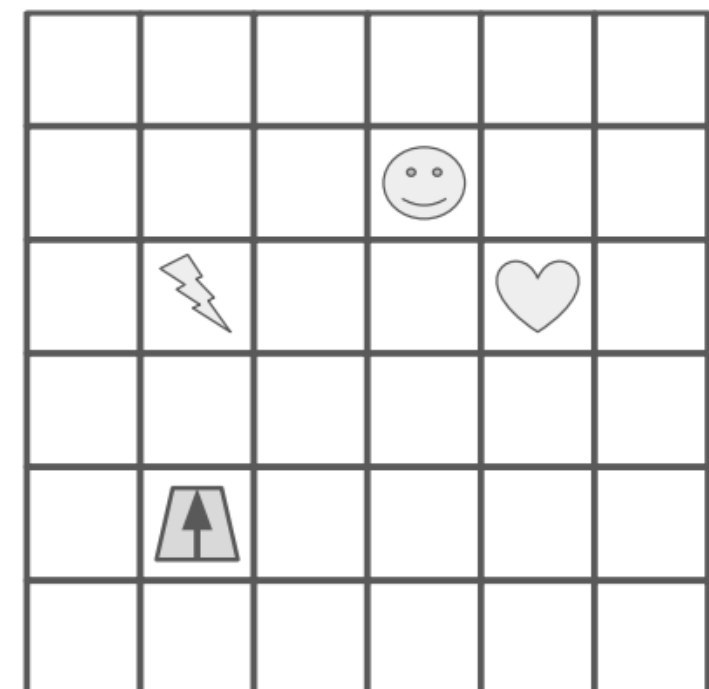
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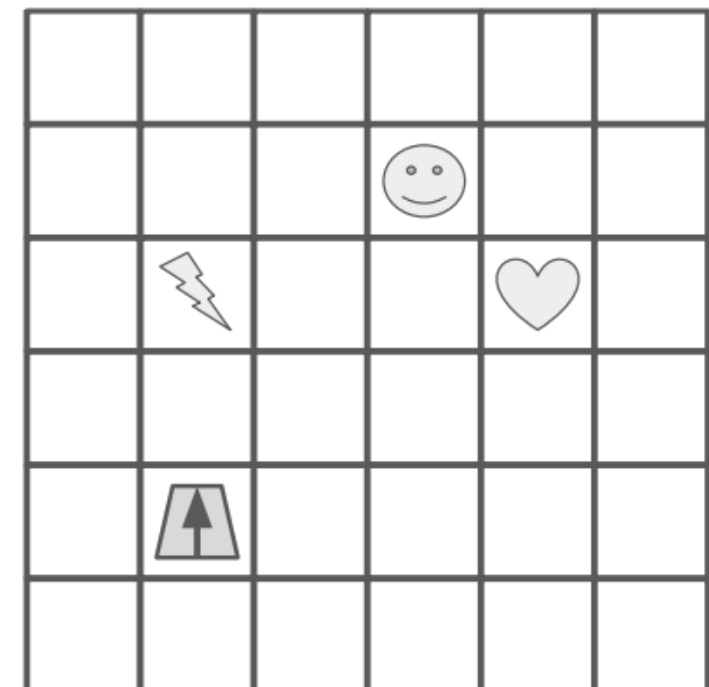
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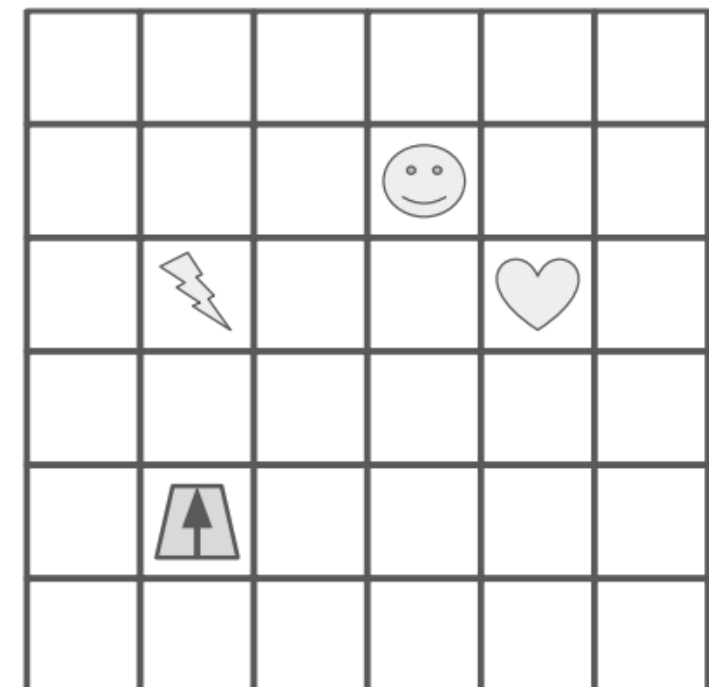
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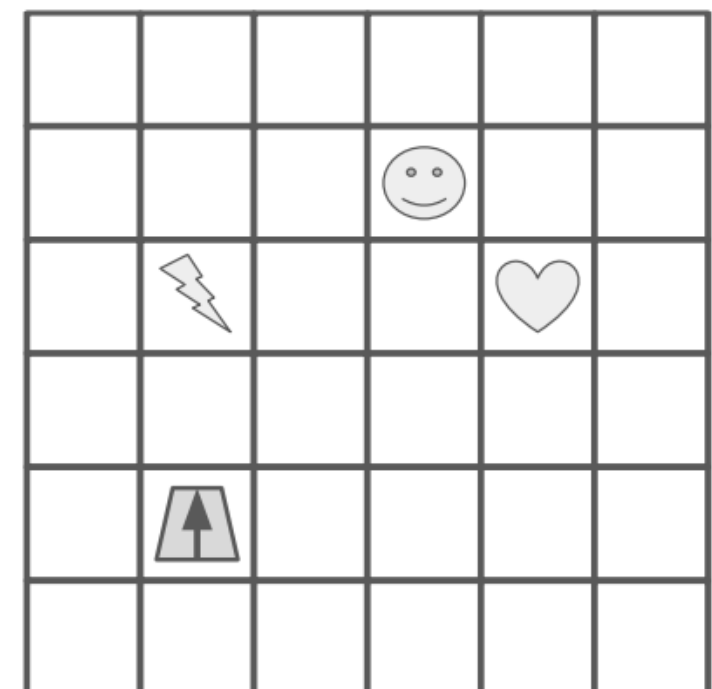
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next lecture, we'll learn how to write our own new functions

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Vocabulary

- ...

General Function Concepts

Some Code

...

code

...

code

...



Yikes, copied code!

Vocabulary

- **refactor**: change organization of code (e.g., to avoid repetition)

A Function

code

Some Code

...

call/invoke

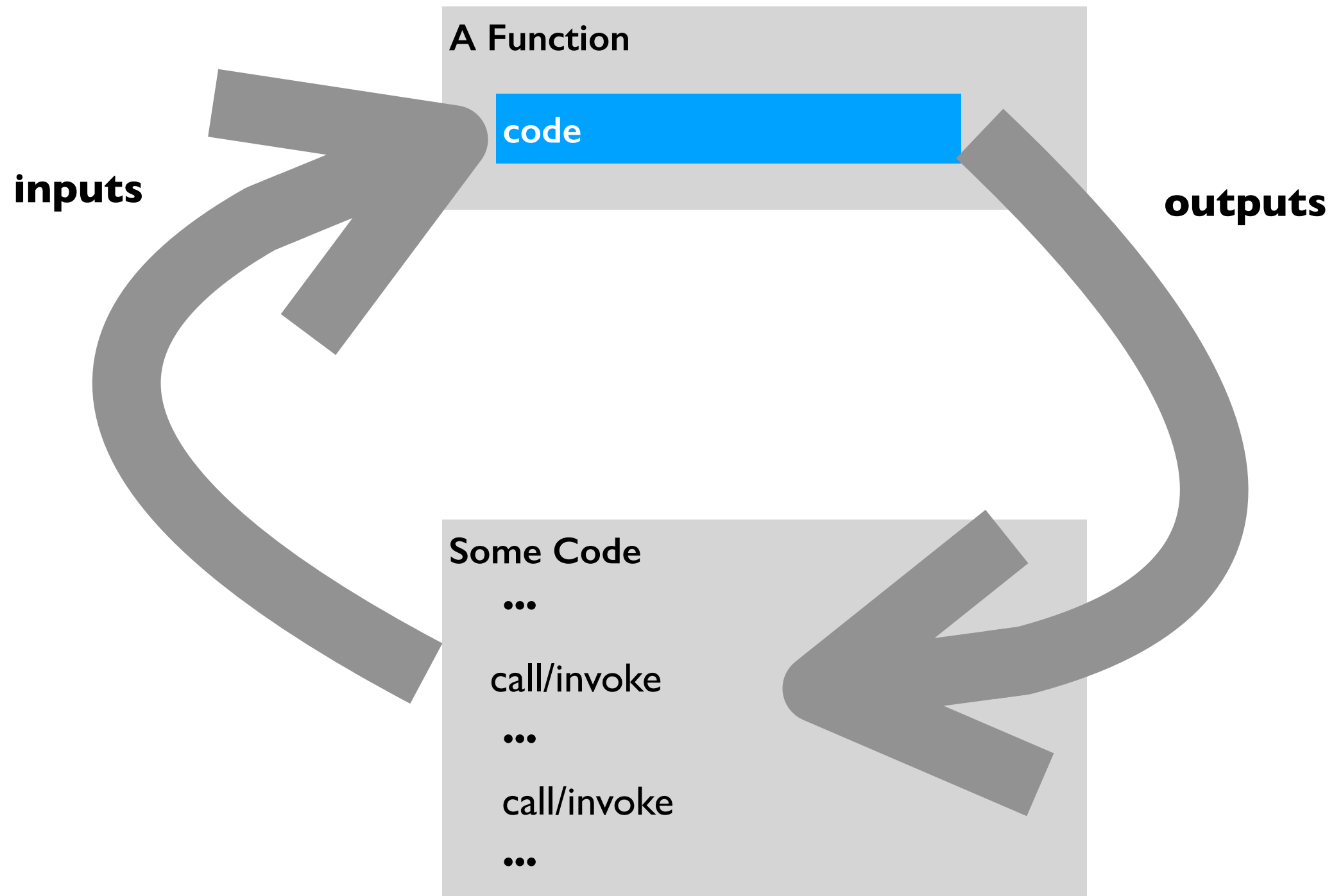
...

call/invoke

...

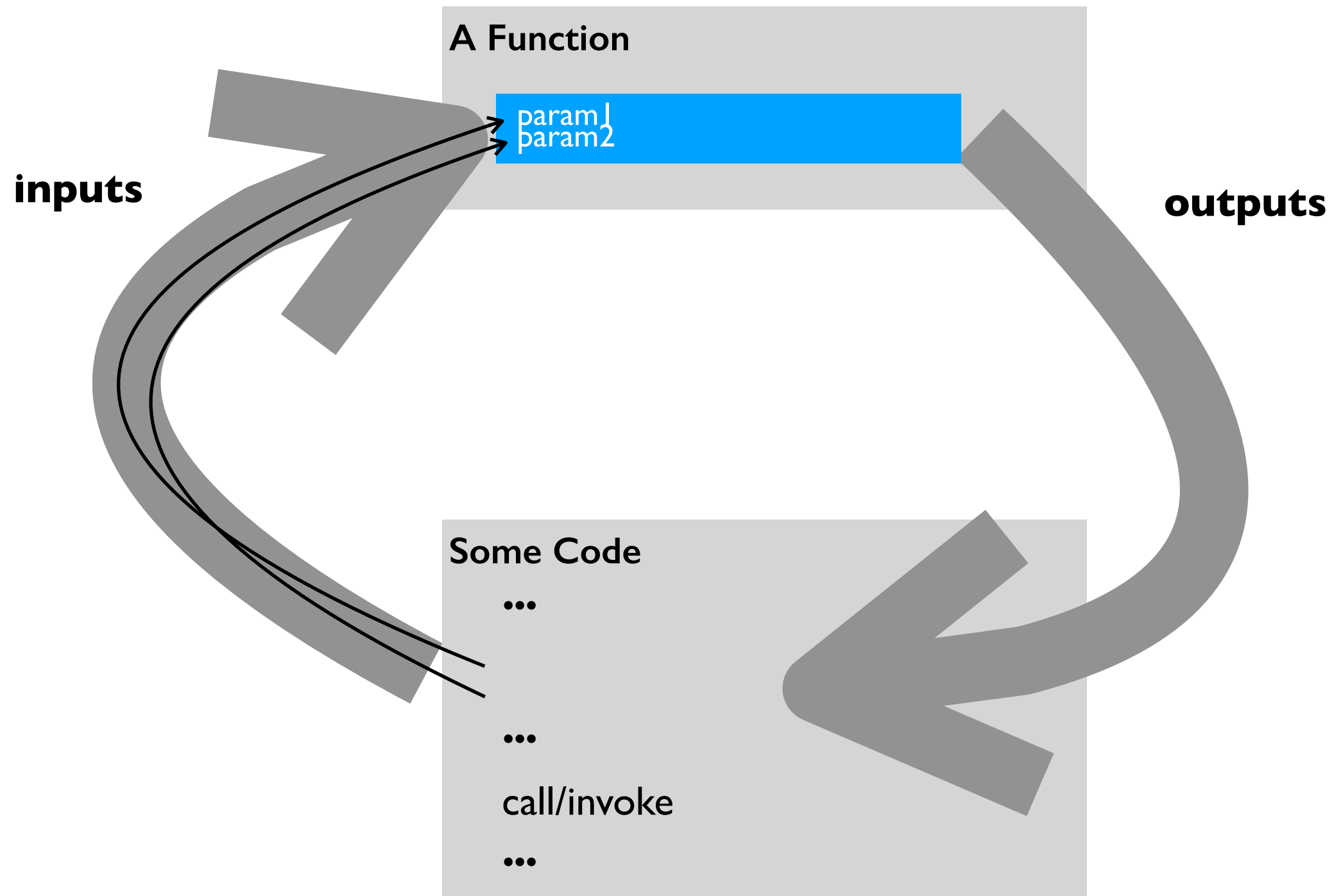
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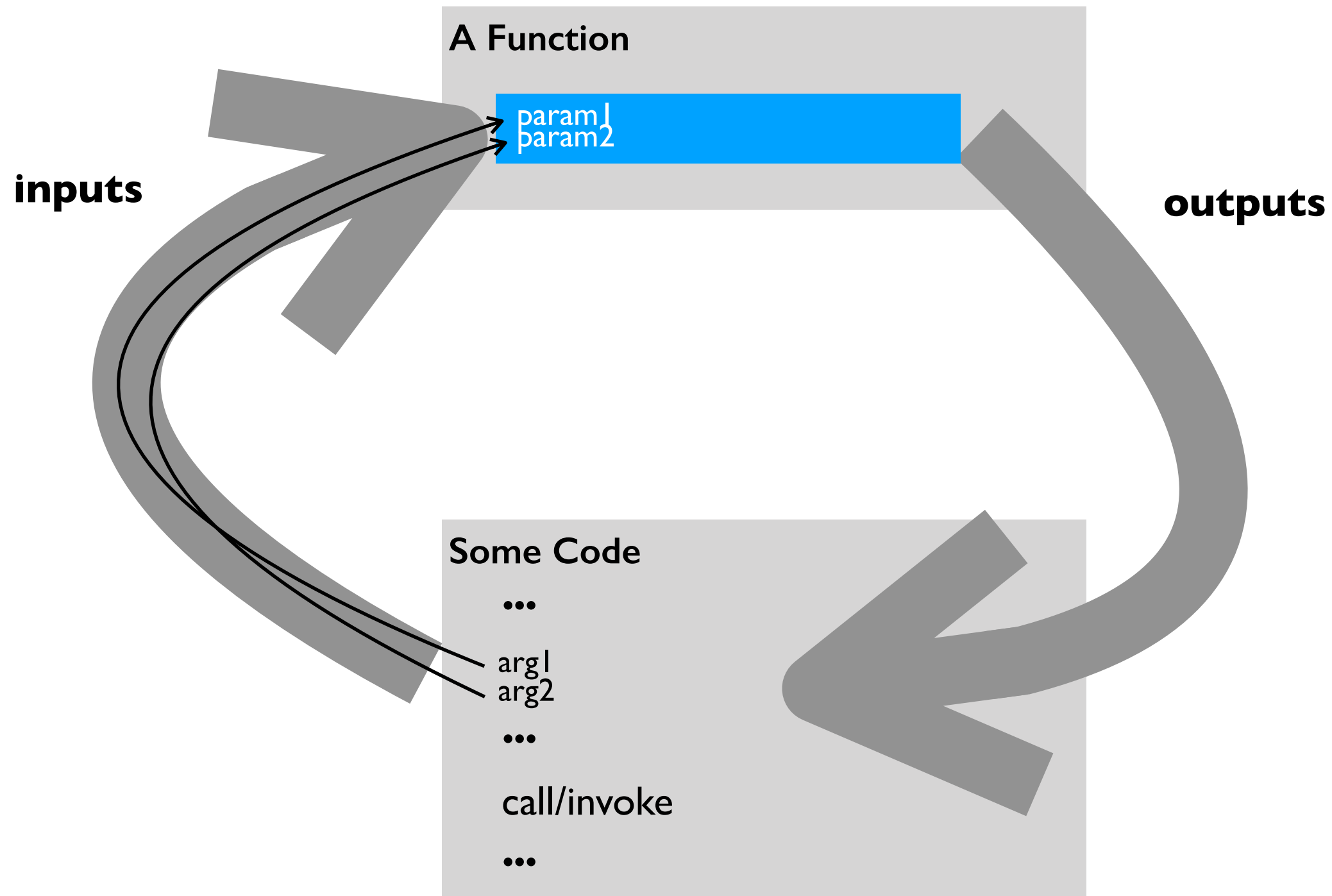
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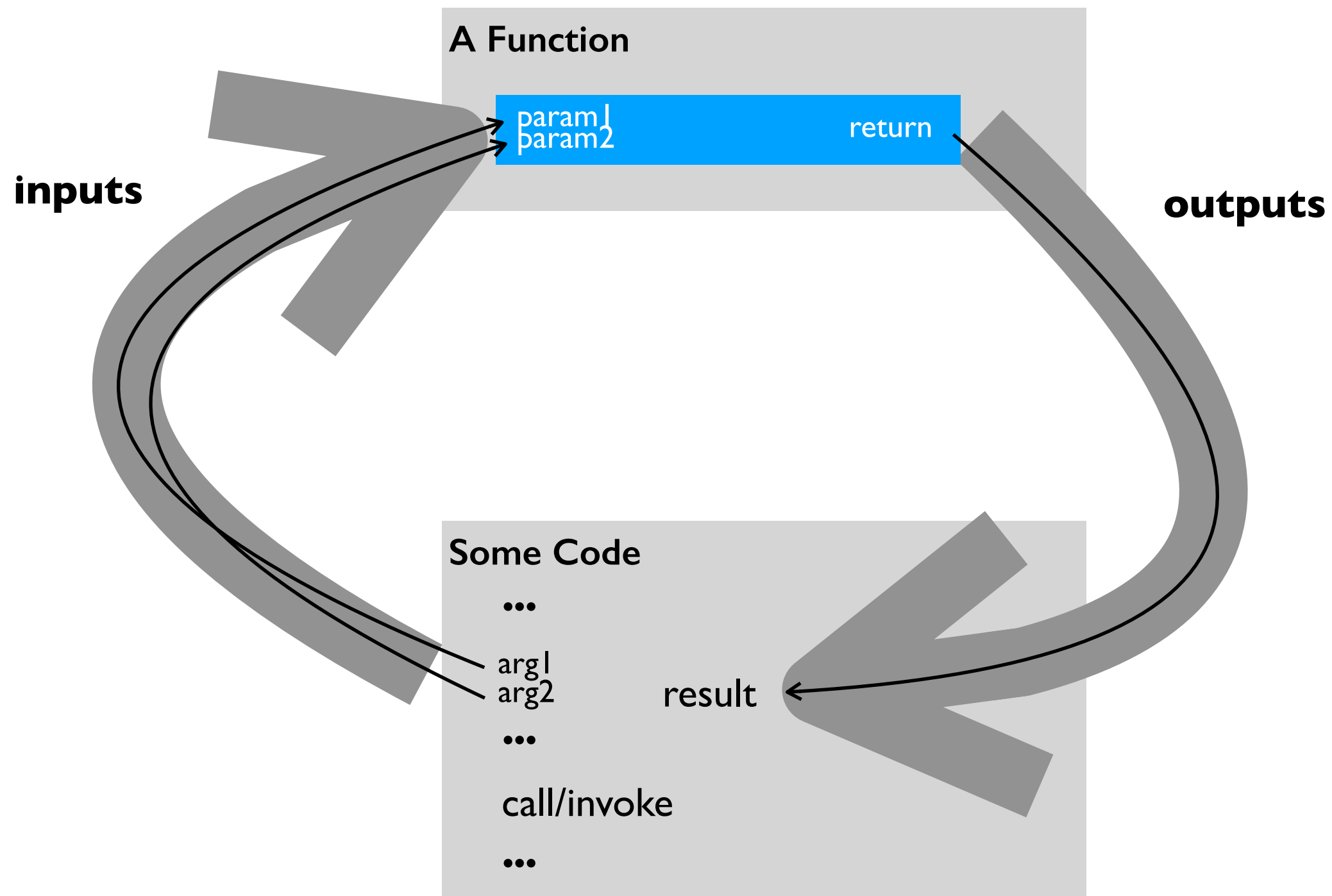
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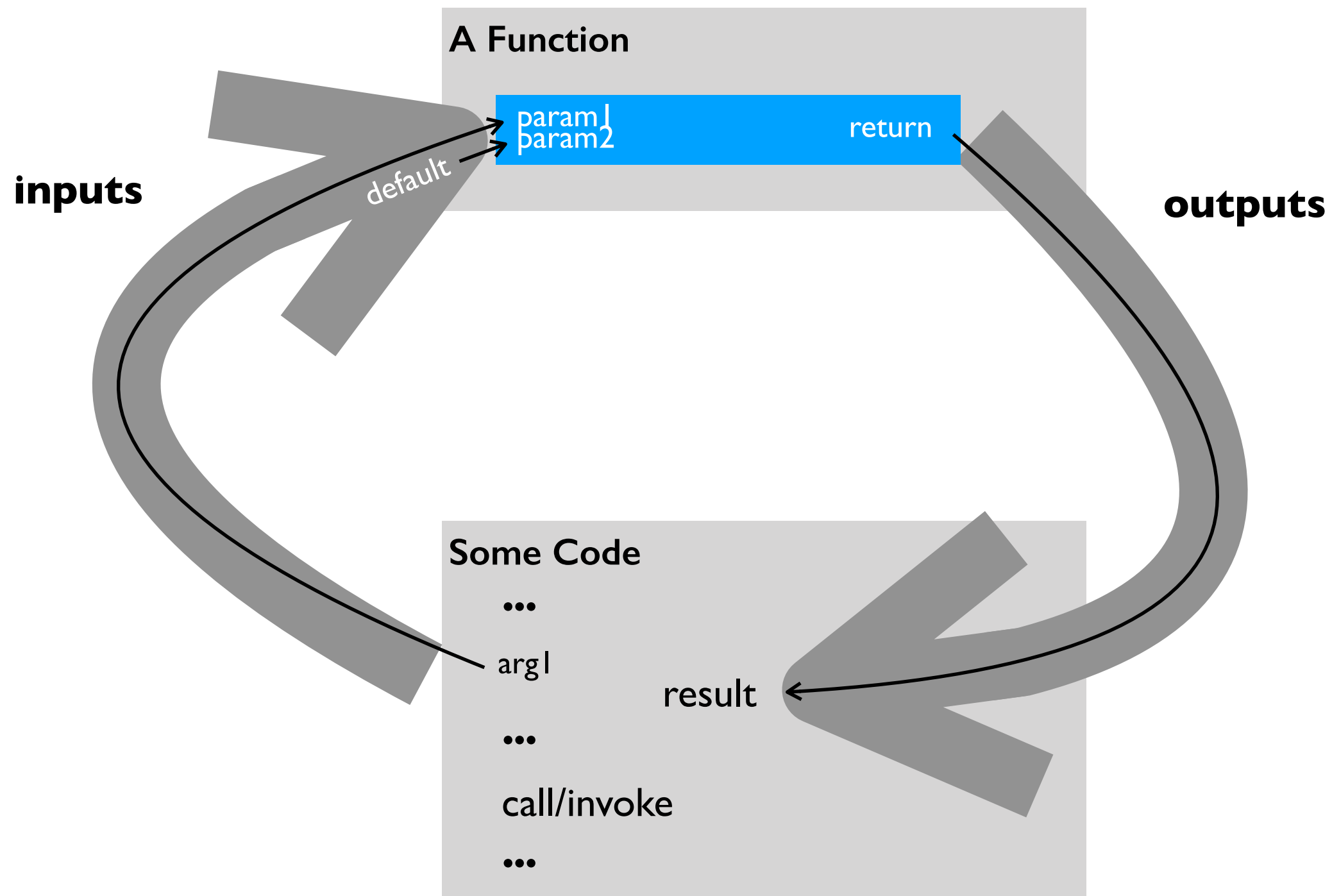
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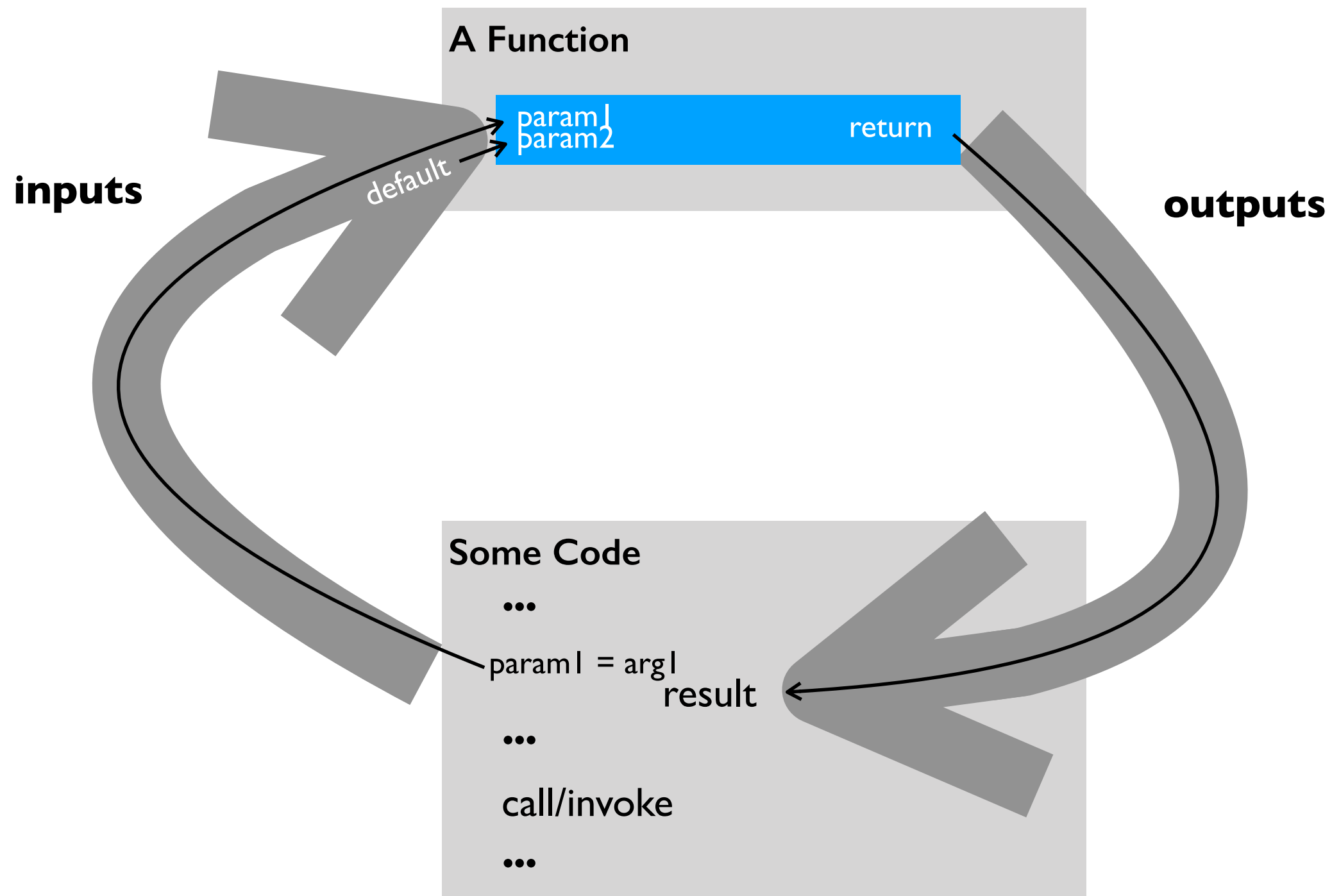
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- **return value (or result)**: function output sent back to calling code
- **default argument**: value put in parameter if argument not passed
- **named/keyword argument**: argument explicitly tied to a parameter



Calling/Invoking a Function in Python

```
print("hello")  
result = f(x)
```

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ALWAYS: followed by parentheses

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arguments

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SOMETIMES: with one or more arguments

Calling/Invoking a Function in Python

`print("hello")`

`result = f(x)`

 **return value**

ALWAYS: function's name

ALWAYS: followed by parentheses

SOMETIMES: with one or more arguments

SOMETIMES: producing a result

Calling/Invoking a Function in Python

```
print("hello", "world")  
x = input()
```

ALWAYS: function's name

ALWAYS: followed by parentheses

SOMETIMES: with one or more arguments

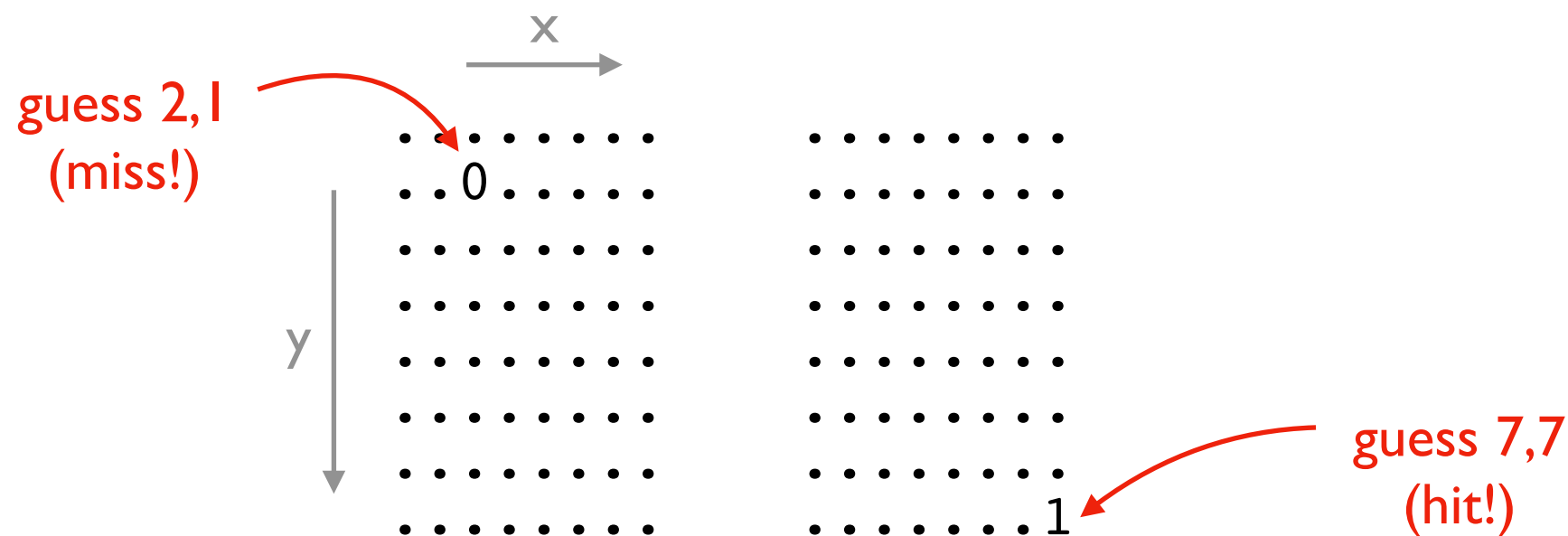
SOMETIMES: producing a result

demos

Battleship Demo (Version I)



<https://boardgamegeek.com/image/288374/battleship>

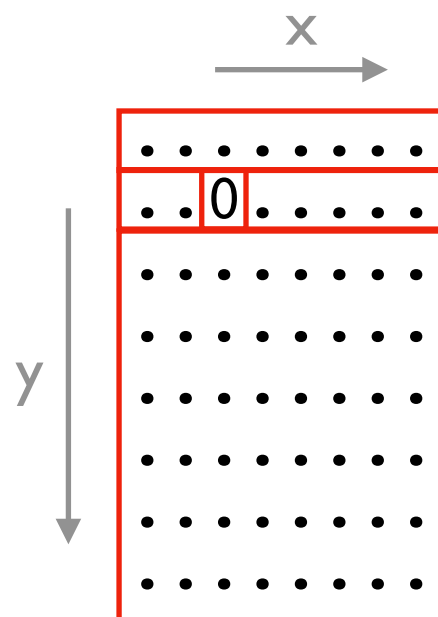


- ### Version I (MVP)
- 1 ship, 1 guess
 - ship is 1 space
 - fixed position
 - top/left is 0,0
 - horrible graphics

Battleship Demo (Version I)



<https://boardgamegeek.com/image/288374/battleship>



idea: decompose problem into five parts!