CSCI 141

Lecture 13:
A tiny bit more on Functions
Midterm Review

Announcements

- QOTD 10/21:

    - is now due Friday.

    - everyone now has a second attempt.

- There is no QOTD 10/23.

Goals

- As time allows:

  - Know the syntax for defining your own functions

  - Know how to define and use functions that take no arguments and return no values

  - Know how to use parameters to refer to the input arguments of a function

- Review for the midterm.

Functions, Revisited

What **is** a function, anyway?

- As a user, you can treat a function as a **"black box":** all you need to know is:
  - the **inputs**, **effects**, and **return value**.

- Functions are named chunks of code.

Input(s) $\longrightarrow$ ■ $\longrightarrow$ **Return value**

(Effects)

A bunch of (complicated)
stuff is wrapped up in a nice,
easy-to-use package.

QOTD

- Which of the following is a true statement about the print function?

  - It does not take inputs (arguments)

  - It does not return a value

  - It does not have any effects

  - Using it requires knowing how it is written

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- Functions are named chunks of code.

Input(s) $\longrightarrow$ ▮ $\longrightarrow$ **Return value**

(Effects)

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stuff is wrapped up in a nice,
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Writing Functions: Syntax

Input(s)

Looking inside the black box…

```
def name(parameters):
    statements
```

→ **(Effects)**
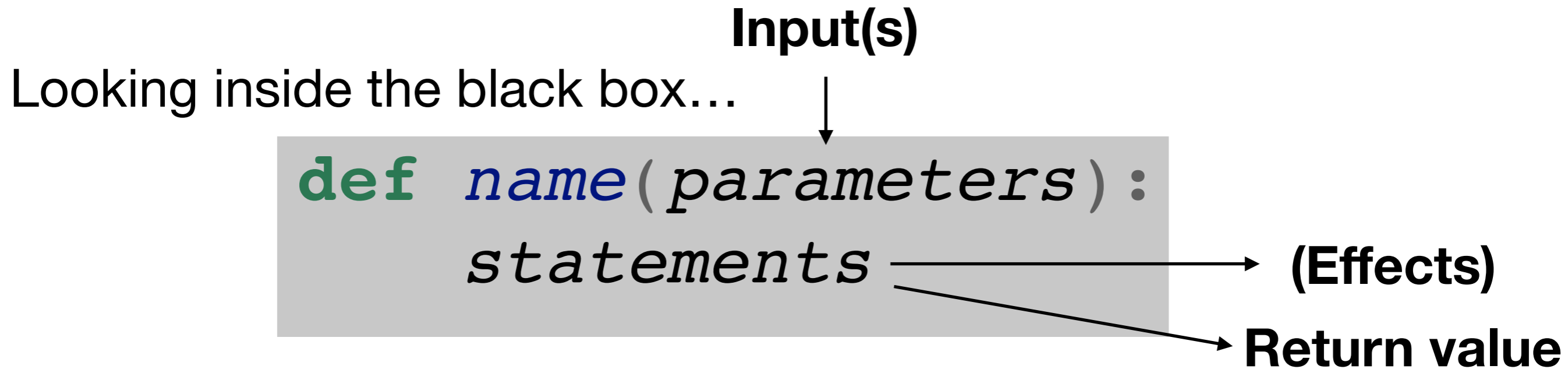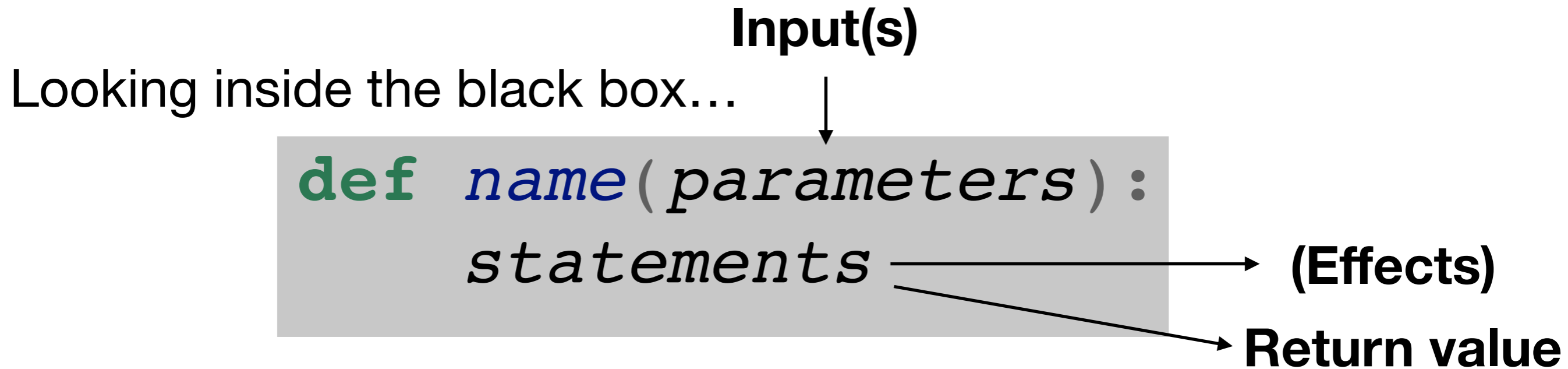
→ **Return value**

Writing Functions: Syntax

Input(s)

Looking inside the black box…

```
def name(parameters):
    statements
```

(Effects)

Return value

Two important questions:

Writing Functions: Syntax

Input(s)

Looking inside the black box…

```
def name(parameters):
        statements ————————→ (Effects)
                    ——————→ Return value
```
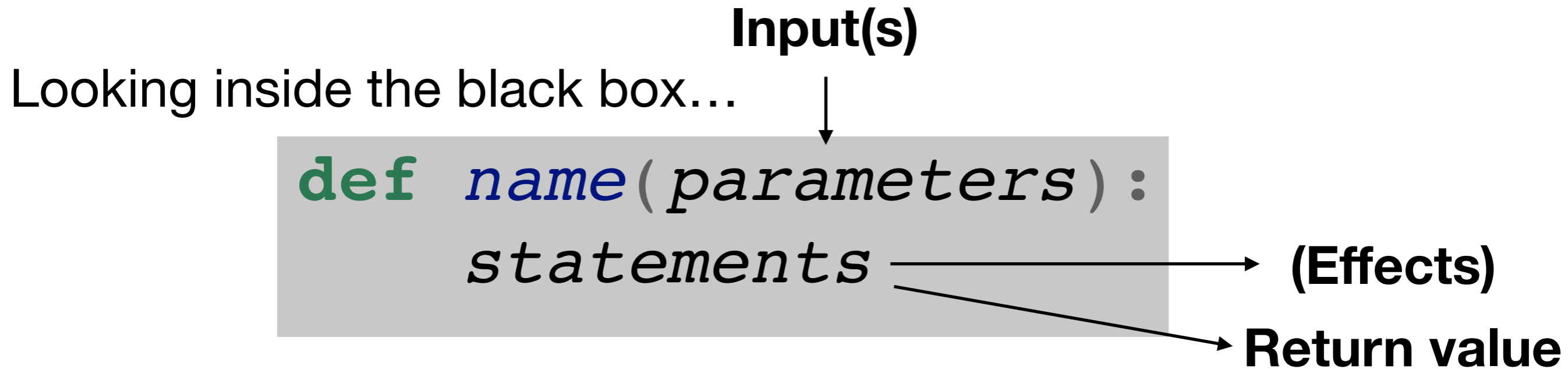
Two important questions:
1. How does the function use the arguments (inputs) passed to it?

Writing Functions: Syntax

Input(s)

Looking inside the black box…

```
def name(parameters):
    statements
```

→ **(Effects)**

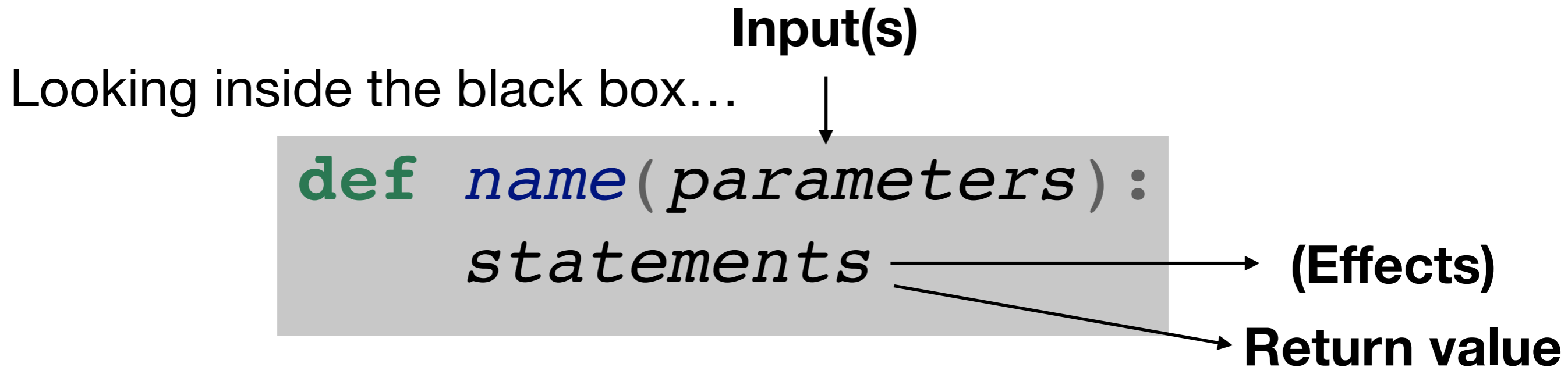**Return value**

Two important questions:
1. How does the function use the arguments (inputs) passed to it?
2. How does the function return a value?

Writing Functions: Syntax

Input(s)

Looking inside the black box…

```
def name(parameters):
        statements
```

→ **(Effects)**

→ **Return value**

Two important questions:
1. How does the function use the arguments (inputs) passed to it?
2. How does the function return a value?

Let's **dodge** these questions for a moment…

Functions: the simplest kind

No arguments, no return value:

```python
def name():
    statements
```

Example:

```python
def print_hello():
    print("Hello, world!")
```

Demo: Function to print a rectangle of # symbols

Input(s):

- none

Return value:

- none

`print_rectangle`

Effects: prints a 2x10 rectangle of #s to the screen

Demo: Function to print a rectangle of a symbol passed in as an argument.

Input(s):
- character to make a rectangle out of

Return value:
- none

⟶ `print_rectangle` ⟶

Effects: prints a 2x10 rectangle of the given character to the screen

Divisibility Checks

- Which of the following is True if and only if a is *divisible* by b?

  ```
  A. b // a == 0
  B. b % a == 0
  C. a // b == 0
  D. a % b == 0
  ```

Midterm Review: Questions?

Leftover Socrative Questions

- L04 - Operators

- L07 - Boolean evaluation practice

Code!

Write a program that computes the sum of the first 100000 terms of the following series:

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \dots$$

Then, multiply the result by 6 and take its square root.

Code!

Write a program that prints the result of a random roll of a pair of dice each time the user presses enter, and quits when they enter "exit".