Methods

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- Built-in objects in Python have a variety of methods you can use!
- Let’s explore in a bit more detail how to find methods and how to get information about them.

Functions

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- Creating clean repeatable code is a key part of becoming an effective programmer.
- **Functions** allow us to create blocks of code that can be easily executed many times, without needing to constantly rewrite the entire block of code.

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- Functions will be a huge leap forward in your capabilities as a Python programmer.
- This means that the problems you are able to solve can also be a lot harder!

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- It is very important to get practice combining everything you've learned so far (control flow, loops, etc.) with functions to become an effective programmer.

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- This may be a point in your progress where you may get discouraged or frustrated, do not worry, this is completely normal and very common!
- We will guide you step by step, be patient with yourself and practice, practice, practice!!

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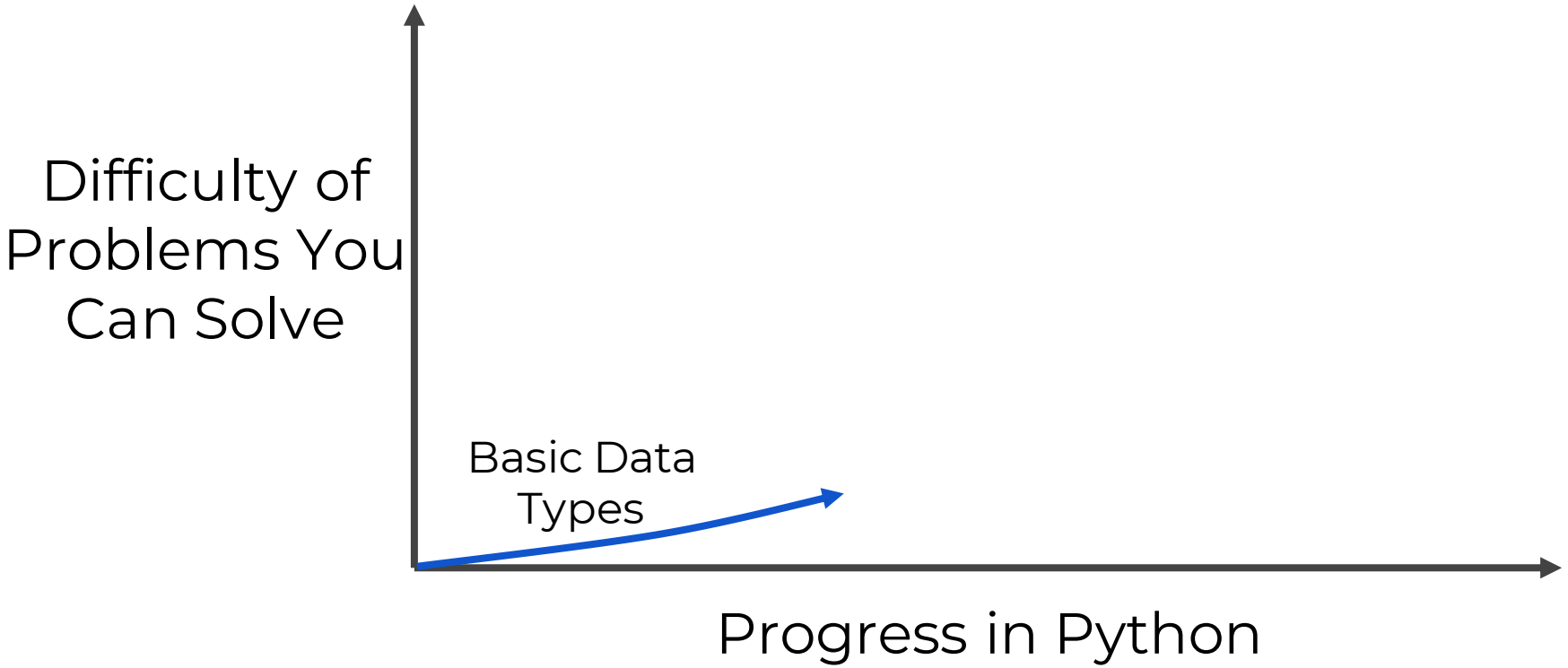

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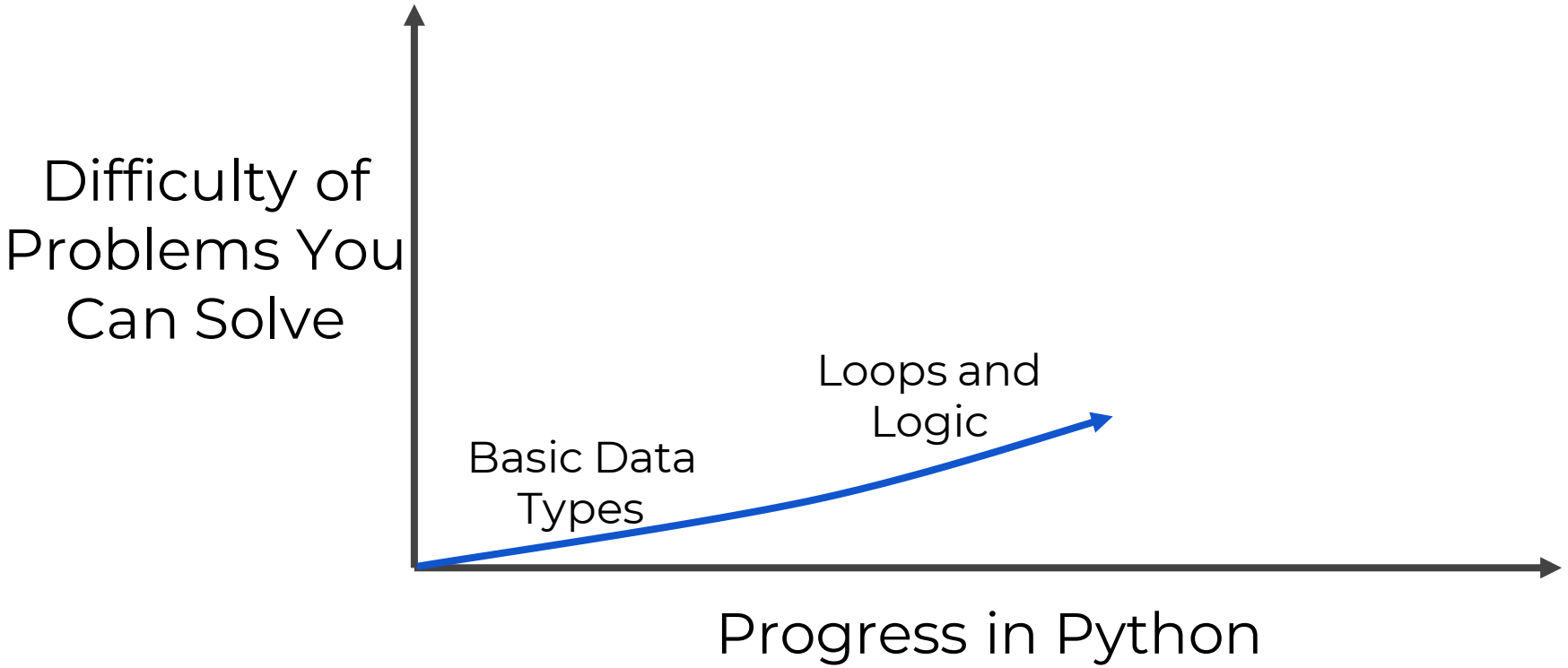

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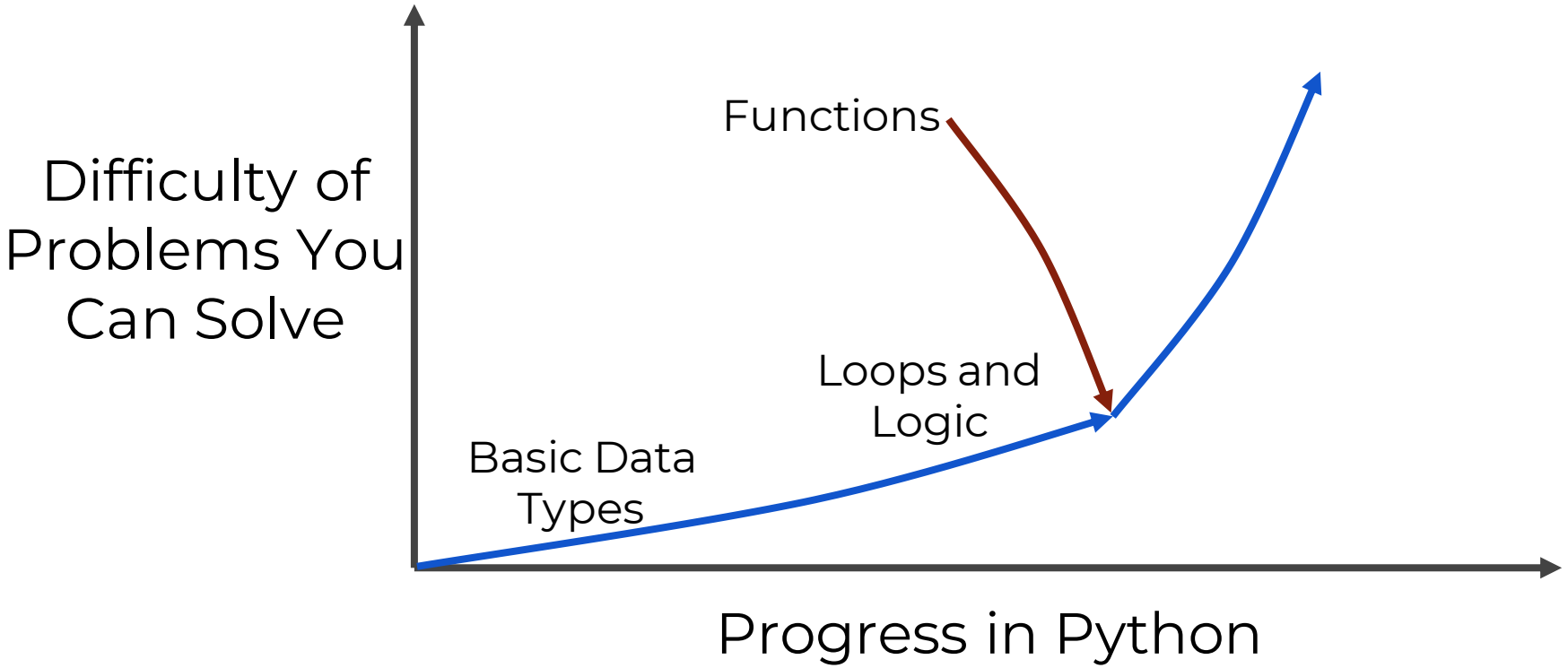

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- Be patient with yourself.

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- Be patient with yourself.
- Take your time to practice the material.

Complete Python Bootcamp

- Be patient with yourself.
- Take your time to practice the material.
- Start getting excited about your new skills and start thinking about personal projects.

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- Let’s learn how to create functions with Python!

def Keyword

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- Creating a function requires a very specific syntax, including the **def** keyword, correct indentation, and proper structure.
- Let’s get an overview of a Python function structure.

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```
def name_of_function():
```

Keyword telling Python this is a function.

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```
def name_of_function():
```

You decide on the function name. Notice "snake casing"

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```
def name_of_function():
```

Snake casing is all lowercase with underscores between words

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```
def name_of_function():
```

Parenthesis at the end. Later on we can pass in arguments/parameters into the function.

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```
def name_of_function():
```

A colon indicates an upcoming indented block. Everything indented is then “inside” the function

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```
def name_of_function():
    '''
    Docstring explains function.
    '''
```

Optional: Multi-line string to describe function.

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```
def name_of_function():
    '''
    Docstring explains function.
    '''
```

Note: Everything inside the function is indented

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```
def name_of_function():
    ”””
    Docstring explains function.
    ”””

    print(“Hello”)
```

Code then goes inside the function.

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```
def name_of_function():
    ”””
    Docstring explains function.
    ”””
        print(“Hello”)
```

Function can then be executed/called to see the result.

```
>> name_of_function()
>> Hello
```

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```
def name_of_function():
    ”””
    Docstring explains function.
    ”””
    print(“Hello”)
```

```
>> name_of_function()
>> Hello
```

Resulting Output

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```
def name_of_function(name):
    ”””
    Docstring explains function.
    ”””
        print(“Hello ”+name)
```

```
>> name_of_function(“Jose”)
>> Hello Jose
```

Functions can accept arguments to be passed by the user.

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```
def name_of_function(name):
    '''
    Docstring explains function.
    '''
    print("Hello "+name)
```

```
>> name_of_function("Jose")
>> Hello Jose
```

Functions can accept arguments to be passed by the user.

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- Typically we use the **return** keyword to send back the result of the function, instead of just printing it out.
- **return** allows us to assign the output of the function to a new variable.

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- We will have a deeper discussion of the **return** keyword later on in the notebook.

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```
def add_function(num1,num2):
    return num1+num2
```

```
>> result = add_function(1,2)
>>
>> print(result)
>> 3
```

Return allows to save the result to a variable.

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```
def add_function(num1,num2):
    return num1+num2
```

```
>> result = add_function(1,2)
>>
>> print(result)
>> 3
```

Most functions will use return. Rarely will a function only print()

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- Let’s start creating functions with Python.

Basic Functions

The return Statement

Functions with Logic

Interactions Between Functions

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- Typically a python script or notebook contains several functions interacting with each other.
- Let’s create a few functions to mimic the carnival guessing game “Three Cup Monte”

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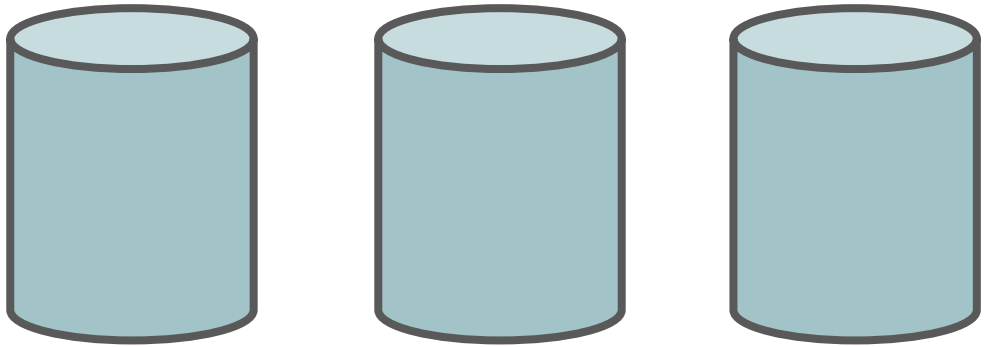

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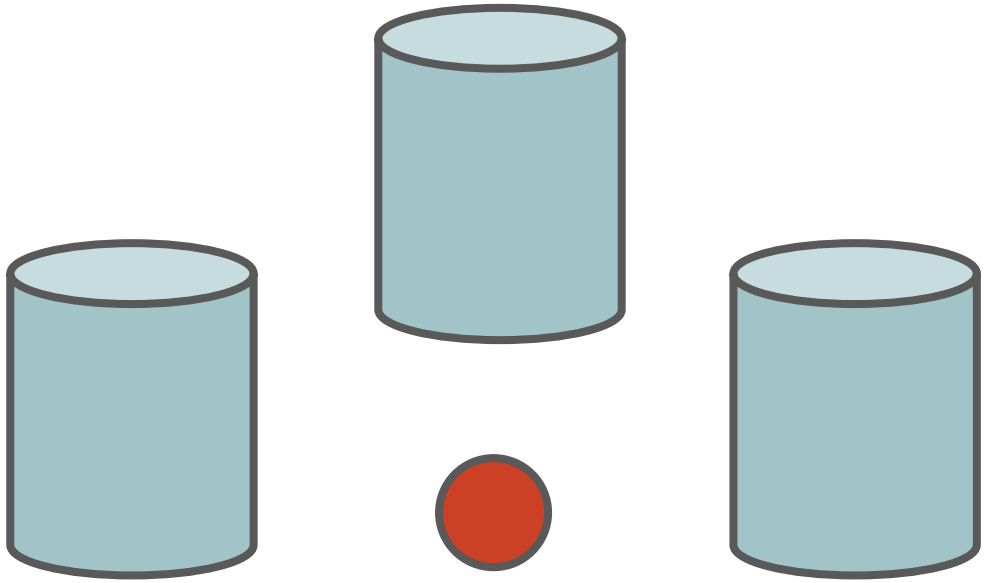

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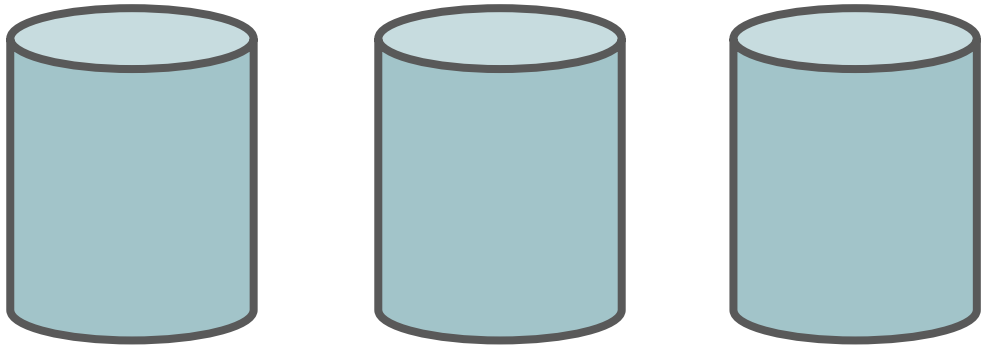

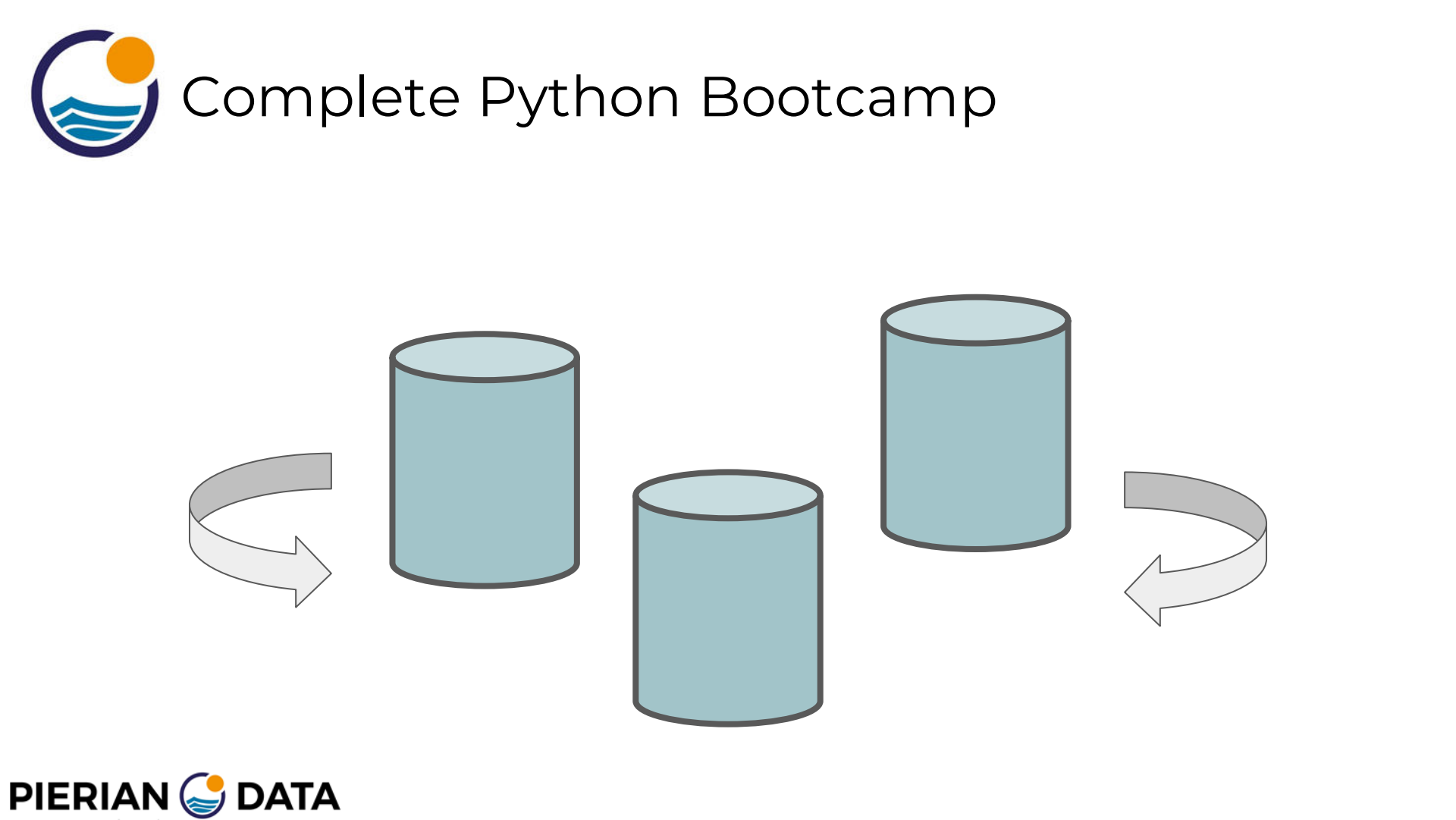
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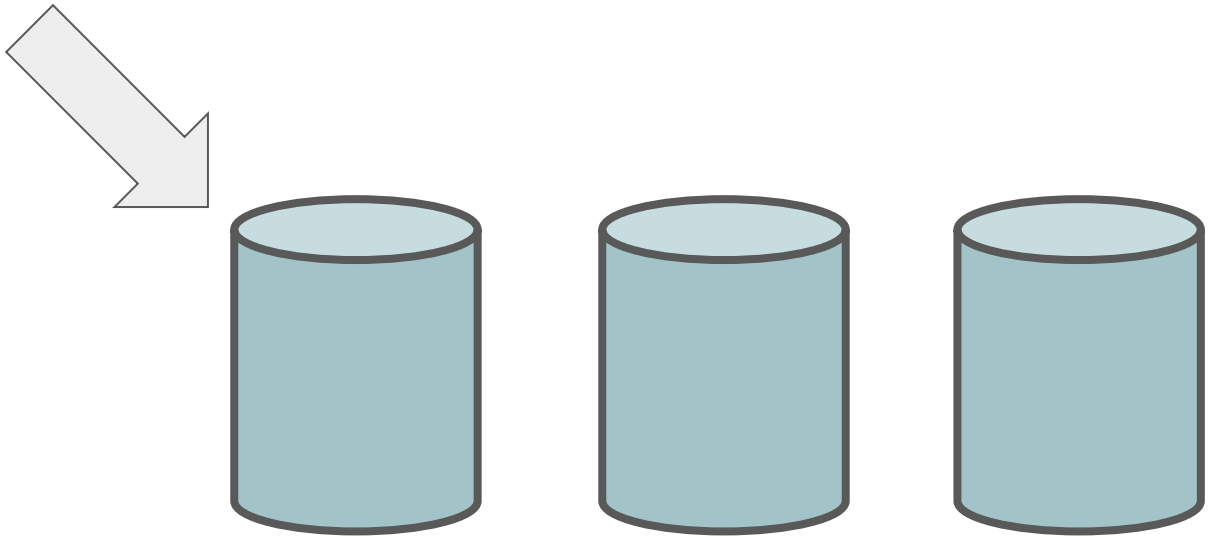

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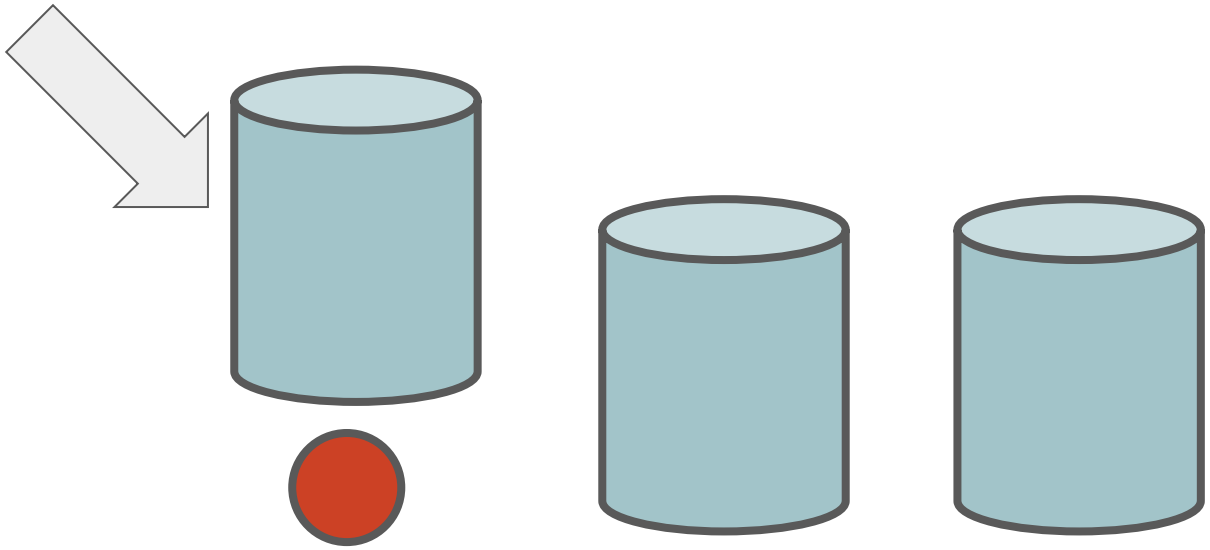

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- Our simple game won't actually show the cups or ball, instead we will simply mimic the effect with a Python list.
- Our simple version will also not show the shuffle to the user, so the guess is completely random.

Function Practice Problems

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- Learning functions increases your Python skills exponentially.
- This also means that the difficulties of problems you can solve also increases drastically.

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- Let’s get some practice with converting problem statements into Python code.
- We’ll go through a series of Function Practice Exercises.
- After this lecture we will go through the solutions.

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- There are two options for this material:
    - Try out the exercises yourself, then go through the solutions.
    - Treat the solutions as a code-along lecture for more guided practice.

Function Practice Problems Solutions Level 2

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Methods and Functions

HOMEWORK OVERVIEW

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Methods and Functions

HOMEWORK SOLUTIONS

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Lambda Expressions Map and Filter

*args and **kwargs