

**CAREER***FOUNDRY*

# **Python for Web Developers Learning Journal**

# Objective

We find that the students who do particularly well in our courses are those who practice metacognition. Metacognition is the art of thinking about thinking; developing a deeper understanding of your own thought processes. With the help of this Learning Journal, you'll broaden your metacognitive knowledge and skills by reflecting on what you learn in this course.

Thanks to this Learning Journal, when you finish the course you'll have a complete and detailed record of your learning journey and progress over time. We really recommend that you take the time to complete this Journal; students do better in CF courses and in the working world as a result!

## Directions

First, complete the pre-work section before you start your course. Then, once you've begun learning, take time after each Exercise to return to this Journal and respond to the prompts.

There will be 3 to 5 prompts per Exercise, and we recommend spending about 10 to 15 minutes in total answering them. Don't overthink it—just write whatever comes to mind!

Also make sure that, once you've started filling this document in, you upload it as a deliverable on the platform. This is so that your mentor can also see your Journal and how you're progressing over time. Don't worry though—what you write here won't affect how you're graded for the Exercise tasks. The learning journal is mostly for you and your self-evaluation!

## Pre-Work: Before You Start the Course

**Reflection questions (to complete before your first mentor call)**

1. What experiences have you had with coding and/or programming so far? What other experiences (programming-related or not) have you had that may help you as you progress through this course?

Over the 17 years I have worked at my full time job, I have developed my creative problem-solving skills which will be useful when learning to code.

2. What do you know about Python already? What do you want to know?

I only have a very basic understanding of Python currently including if statements, loops, and basic inputs. I know it is a language that can be suitable for many different kinds of projects, has a simple syntax, and is a suitable language for a junior web developer to learn. I want to learn Python to make me a more versatile developer and be more appealing to potential employers.

3. What challenges do you think may come up while you take this course? What will help you face them? Think of specific spaces, people, and times of day of week that might be favorable to your facing challenges and growing. Plan for how to solve challenges that arise.

As a creative individual, I may struggle with this language because of its main use being back-end programming. I enjoy making visual changes that other people can enjoy, so I may struggle a bit with keeping myself motivated..

Remember, you can always refer to [Exercise 1.4](#) of the Orientation course if you're not sure whom to reach out to for help and support.

## Exercise 1.1: Getting Started with Python

### Learning Goals

- Summarize the uses and benefits of Python for web development
- Prepare your developer environment for programming with Python

### Reflection Questions

1. In your own words, what is the difference between frontend and backend web development? If you were hired to work on backend programming for a web application, what kinds of operations would you be working on?

The main difference between frontend and backend development would be that frontend mostly involves the client side. This would be the visual parts of a project that a user would be

interacting with. The backend houses all of the logic responsible for obtaining information behind the scenes, and isn't seen by the user..

2. Imagine you're working as a full-stack developer in the near future. Your team is asking for your advice on whether to use JavaScript or Python for a project, and you think Python would be the better choice. How would you explain the similarities and differences between the two languages to your team? Drawing from what you learned in this Exercise, what reasons would you give to convince your team that Python is the better option?

*As opposed to JavaScript, Python has a much simpler syntax and would be more suitable in projects where the developers were unfamiliar with both languages. Python would also be more suitable for developers who prefer object oriented programming languages.*

3. Now that you've had an introduction to Python, write down 3 goals you have for yourself and your learning during this Achievement. You can reflect on the following questions if it helps you. What do you want to learn about Python? What do you want to get out of this Achievement? Where or what do you see yourself working on after you complete this Achievement?

Outside of my career, I want to develop a game that uses Python as the logic behind it. I am still unfamiliar with Python, but I see myself using Python to display data, or perhaps to make an API.

## Exercise 1.2: Data Types in Python

### Learning Goals

- Explain variables and data types in Python
- Summarize the use of objects in Python
- Create a data structure for your Recipe app

### Reflection Questions

1. Imagine you're having a conversation with a future colleague about whether to use the iPython Shell instead of Python's default shell. What reasons would you give to explain the benefits of using the iPython Shell over the default one?

The main benefit of using iPython over the default shell comes down to user-friendliness. As opposed to the python shell, iPython features auto indentation and syntax highlighting, making testing a lot more efficient.

2. Python has a host of different data types that allow you to store and organize information. List 4 examples of data types that Python recognizes, briefly define them, and indicate whether they are scalar or non-scalar.

| Data type | Definition   | Scalar or Non-Scalar? |
|-----------|--|-----------------------|
| int       | An integer, or whole number                          | Scalar                |
| float     | A number containing decimals                         | Scalar                |
| bool      | Can be one of two values: True or False              | Scalar                |
| NoneType  | Only one value: None (similar to null in JavaScript) | Scalar                |

3. A frequent question at job interviews for Python developers is: what is the difference between lists and tuples in Python? Write down how you would respond.

The main difference in Tuples and Lists would be that Tuples are immutable, and have faster loading times. Lists on the other hand, CAN be altered, but take a little bit more time to load. Another difference is that saying "List" out loud sounds normal, but saying "Tuple" sounds pretty goofy.

4. In the task for this Exercise, you decided what you thought was the most suitable data structure for storing all the information for a recipe. Now, imagine you're creating a language-learning app that helps users memorize vocabulary through flashcards. Users can input vocabulary words, definitions, and their category (noun, verb, etc.) into the flashcards. They can then quiz themselves by flipping through the flashcards. Think about the necessary data types and what would be the most suitable data structure for this language-learning app. Between tuples, lists, and dictionaries, which would you choose? Think about their respective advantages and limitations, and where flexibility might be useful if you were to continue developing the language-learning app beyond vocabulary memorization.

If I were to make an app like this, at the top level I would have a list containing all languages that could be learned. Each of these named languages would be lists themselves containing different types of questions. Each type of question would also be a list containing dictionaries holding multiple key-value pairs representing the questions and answers that would be rendered for the user.

## Exercise 1.3: Functions and Other Operations in Python

### Learning Goals

- Implement conditional statements in Python to determine program flow

- Use loops to reduce time and effort in Python programming
- Write functions to organize Python code

## Reflection Questions

1. In this Exercise, you learned how to use **if-elif-else** statements to run different tasks based on conditions that you define. Now practice that skill by writing a script for a simple travel app using an **if-elif-else** statement for the following situation:
  - The script should ask the user where they want to travel.
  - The user's input should be checked for 3 different travel destinations that you define.
  - If the user's input is one of those 3 destinations, the following statement should be printed: "Enjoy your stay in \_\_\_\_\_!"
  - If the user's input is something other than the defined destinations, the following statement should be printed: "Oops, that destination is not currently available."

Write your script here. (*Hint: remember what you learned about indents!*)

```
travel_destination = str(input("Where would you like to go?\n"))
if travel_destination = "New York" or travel_destination = "Alaska" or travel_destination = "Greenland":
    print("Enjoy your stay in " + travel_destination)
else:
    print("Oops, that destination is not currently available")
```

2. Imagine you're at a job interview for a Python developer role. The interviewer says "Explain logical operators in Python". Draft how you would respond.

Logical operators are three specific operators("and", "or", and "not") used in conditional statements that return a value of True or False.

3. What are functions in Python? When and why are they useful?

Functions are organized sets of code that you can run to perform an action. They can take in data before they run and can even return data as well! You can make them yourself or you can use prebuilt functions to suit your needs. Functions are perfect for when you need something specific done multiple times in a project. Once you create the function, you can call it whenever you need it!

4. In the section for Exercise 1 in this Learning Journal, you were asked in question 3 to set some goals for yourself while you complete this course. In preparation for your next mentor call, make some notes on how you've progressed towards your goals so far.

I have not started to make a game using Python yet, but my understanding of basic concepts is increasing quite fast. I am eager to learn more about Python so I can learn how to incorporate it into new projects.

## Exercise 1.4: File Handling in Python

### Learning Goals

- Use files to store and retrieve data in Python

### Reflection Questions

1. Why is file storage important when you're using Python? What would happen if you didn't store local files?

If you did not store local files, you would not be able to get data from them, or give them data either. All information would be lost when the program ends.

2. In this Exercise you learned about the pickling process with the `pickle.dump()` method. What are pickles? In which situations would you choose to use pickles and why?

Pickles are binary data files that were converted into a stream of bytes from complex data like lists or dictionaries. Pickling would be useful in situations when you need to store complex data in a file or database.

3. In Python, what function do you use to find out which directory you're currently in? What if you wanted to change your current working directory?
4. Imagine you're working on a Python script and are worried there may be an error in a block of code. How would you approach the situation to prevent the entire script from terminating due to an error?  
One way to approach this situation would be to code a try-except block. This will allow you to prepare for common errors/exceptions by coding responses for them which will allow your program to continue running until completion. You can even use the finally block to write code that will run even after a return, which would normally stop the entire function.
5. You're now more than halfway through Achievement 1! Take a moment to reflect on your learning in the course so far. How is it going? What's something you're proud of so far? Is there something

you're struggling with? What do you need more practice with? Feel free to use these notes to guide your next mentor call.

Reading and writing binary files with pickles is a very new concept to me, so I am struggling a bit to understand how they work. Aside from that, I am more comfortable writing functions and I have made a habit to log data in the terminal as I run scripts, which has helped me troubleshoot issues.

## Exercise 1.5: Object-Oriented Programming in Python

### Learning Goals

- Apply object-oriented programming concepts to your Recipe app

### Reflection Questions

1. In your own words, what is object-oriented programming? What are the benefits of OOP?

Object-oriented programming is one of the programming paradigms that revolves around the concept of creating objects (or classes) from classes. Many different projects can benefit from this approach that need multiple instances of a similar object.

2. What are objects and classes in Python? Come up with a real-world example to illustrate how objects and classes work.

Classes contain data and methods that serve as a blueprint for objects (or other classes) you create from them. For example you could create a class called "Product" for a company's products they sell. The Product class might contain empty data for its name, unit price, inventory, and product description. Now you can have the product objects you create inherit that data and make data entry faster forever!

3. In your own words, write brief explanations of the following OOP concepts; 100 to 200 words per method is fine.

| Method       | Description   |
|--------------|---|
| Inheritance  | Inheritance is the concept of passing data/methods from a parent class to a child class. This is a one-way exchange of data (From parent to child only) that can be incredibly helpful when you want to "clone" attributes and methods from one class to another. |
| Polymorphism | Polymorphism is a term that describes the interaction of attributes and methods with the same name across   |



|                      |  |
|----------------------|--|
|                      | multiple classes and data types. For example, if you had two classes that each had a custom method called "greeting()", but each had a different output, if you called each method, you would get each class's respective outputs despite having the name method name.                                 |
| Operator Overloading | Operator overloading describes the implementation of operators to be used (like +, -, =, <, >, etc.) on a custom class. When a custom class is made, you lose support of all operators, so you must create methods for each operator inside of each respective custom class if you plan on using them. |

# Exercise 1.6: Connecting to Databases in Python

## Learning Goals

- Create a MySQL database for your Recipe app

## Reflection Questions

1. What are databases and what are the advantages of using them?

Databases are structured collections of data that can be manipulated using CRUD (Create, Read, Update, and Delete) operations.

2. List 3 data types that can be used in MySQL and describe them briefly:

| Data type | Definition  |
|-----------|---|
| String    | The string data type is a series of characters. This data type is most commonly used to store text.                                   |
| Integer   | The integer data type is used to store a whole number value without a decimal.  |
| JSON      | Javascript Object Notation (JSON) is a standard text-based format for representing structured data based on JavaScript object syntax. |

3. In what situations would SQLite be a better choice than MySQL?

If your database was relatively small, and you did not have multiple users accessing it, SQLite might be a better choice.

4. Think back to what you learned in the Immersion course. What do you think about the differences between JavaScript and Python as programming languages?

JavaScript syntax so far seems much more complex and difficult to learn from a junior's perspective. Also, Python seems to lend itself to the Object-Oriented style of programming, where JavaScript seems to mainly use functional components.

5. Now that you're nearly at the end of Achievement 1, consider what you know about Python so far. What would you say are the limitations of Python as a programming language?

Python doesn't seem to be as widely supported as some of the other languages. Since Python is a dynamically typed language, it can be hard to pinpoint errors at runtime as well.

## Exercise 1.7: Finalizing Your Python Program

### Learning Goals

- Interact with a database using an object-relational mapper
- Build your final command-line Recipe application

### Reflection Questions

1. What is an Object Relational Mapper and what are the advantages of using one?

An ORM is a tool that helps connect OOP to databases and make data management easier.

2. By this point, you've finished creating your Recipe app. How did it go? What's something in the app that you did well with? If you were to start over, what's something about your app that you would change or improve?

This project was extremely difficult, but with all the resources available to me, I pulled through. If I started over, I would have slowed down and paid more attention to specific earlier exercises, as it would have sped up my understanding of some OOP principles.

3. Imagine you're at a job interview. You're asked what experience you have creating an app using Python. Taking your work for this Achievement as an example, draft how you would respond to this question.

"I have spent a bit of time with Python through CareerFoundry's full-stack program, as well as in my personal time. I'm certainly no prodigy and I don't know everything, but I can always improve, and I really do look forward to learning more and pushing my limits as a developer."

4. You've finished Achievement 1! Before moving on to Achievement 2, take a moment to reflect on your learning in the course so far:

- a. What went well during this Achievement?

I feel that learning the core syntax of Python went extremely smoothly.

- b. What's something you're proud of?

I'm proud that I never gave up when facing issues that took hours of troubleshooting to solve.

- c. What was the most challenging aspect of this Achievement?

Learning OOP principles, when the majority of my experience has been with functional components.

- d. Did this Achievement meet your expectations? Did it give you the confidence to start working with your new Python skills?

Absolutely! I look forward to working with Python in a professional environment if anyone wants to hire me over everyone else in this saturated job market.

- e. What's something you want to keep in mind to help you do your best in Achievement 2?

I need to keep in mind that it's okay to revisit older content to freshen up my knowledge, because it's only going to help me move forward with my education.

Well done—you've now completed the Learning Journal for Achievement 1. As you'll have seen, a little metacognition can go a long way!

## Pre-Work: Before You Start Achievement 2

In the final part of the learning journal for Achievement 1, you were asked if there's anything—on reflection—that you'd keep in mind and do similarly or differently during Achievement 2. Think about these questions again:

- Was your study routine effective during Achievement 1? If not, what will you do differently during Achievement 2?

I need to slow down a bit in the earlier sections of a new concept. Without a solid understanding of fundamentals, you have nothing to build off of.

- Reflect on your learning and project work for Achievement 1. What were you most proud of? How will you repeat or build on this in Achievement 2?

I'm proud that I never gave up when facing issues that took hours of troubleshooting to solve. I need to maintain this attitude and not get so frustrated.

- What difficulties did you encounter in the last Achievement? How did you deal with them? How could this experience prepare you for difficulties in Achievement 2?

I had difficulty learning core OOP principles partially because I rushed through it so quickly. I've learned from my mistakes and I will spend more time on fundamental concepts before I continue forward.

Note down your answers and discuss them with your mentor in a call if you like.

Remember that can always refer to [Exercise 1.4](#) of the Orientation course if you're not sure whom to reach out to for help and support.

## Exercise 2.1: Getting Started with Django

### Learning Goals

- Explain MVT architecture and compare it with MVC
- Summarize Django's benefits and drawbacks
- Install and get started with Django

### Reflection Questions

1. Suppose you're a web developer in a company and need to decide if you'll use vanilla (plain) Python for a project, or a framework like Django instead. What are the advantages and drawbacks of each?
2. In your own words, what is the most significant advantage of Model View Template (MVT) architecture over Model View Controller (MVC) architecture?
3. Now that you've had an introduction to the Django framework, write down three goals you have for yourself and your learning process during this Achievement. You can reflect on the following questions if it helps:

- What do you want to learn about Django?
- What do you want to get out of this Achievement?
- Where or what do you see yourself working on after you complete this Achievement?

## Exercise 2.2: Django Project Set Up

### Learning Goals

- Describe the basic structure of a Django project
- Summarize the difference between projects and apps
- Create a Django project and run it locally
- Create a superuser for a Django web application

### Reflection Questions

1. Suppose you're in an interview. The interviewer gives you their company's website as an example, asking you to convert the website and its different parts into Django terms. How would you proceed? For this question, you can think about your dream company and look at their website for reference.  
*(Hint: In the Exercise, you saw the example of the CareerFoundry website in the Project and Apps section.)*
2. In your own words, describe the steps you would take to deploy a basic Django application locally on your system.
3. Do some research about the Django admin site and write down how you'd use it during your web application development.

## Exercise 2.3: Django Models

### Learning Goals

- Discuss Django models, the "M" part of Django's MVT architecture
- Create apps and models representing different parts of your web application
- Write and run automated tests

## Reflection Questions

1. Do some research on Django models. In your own words, write down how Django models work and what their benefits are.
2. In your own words, explain why it is crucial to write test cases from the beginning of a project. You can take an example project to explain your answer.

## Exercise 2.4: Django Views and Templates

### Learning Goals

- Summarize the process of creating views, templates, and URLs
- Explain how the “V” and “T” parts of MVT architecture work
- Create a frontend page for your web application

## Reflection Questions

1. Do some research on Django views. In your own words, use an example to explain how Django views work.
2. Imagine you’re working on a Django web development project, and you anticipate that you’ll have to reuse lots of code in various parts of the project. In this scenario, will you use Django function-based views or class-based views, and why?
3. Read Django’s documentation on the Django template language and make some notes on its basics.

## Exercise 2.5: Django MVT Revisited

### Learning Goals

- Add images to the model and display them on the frontend of your application
- Create complex views with access to the model

- Display records with views and templates

## Reflection Questions

1. In your own words, explain Django static files and how Django handles them.
2. Look up the following two Django packages on Django's official documentation and/or other trusted sources. Write a brief description of each.

| Package    | Description |
|------------|-------------|
| ListView   |             |
| DetailView |             |

3. You're now more than halfway through Achievement 2! Take a moment to reflect on your learning in the course so far. How is it going? What's something you're proud of so far? Is there something you're struggling with? What do you need more practice with? You can use these notes to guide your next mentor call.

## Exercise 2.6: User Authentication in Django

### Learning Goals

- Create authentication for your web application
- Use GET and POST methods
- Password protect your web application's views

## Reflection Questions

1. In your own words, write down the importance of incorporating authentication into an application. You can take an example application to explain your answer.

2. In your own words, explain the steps you should take to create a login for your Django web application.
3. Look up the following three Django functions on Django's official documentation and/or other trusted sources and write a brief description of each.

| Function       | Description |
|----------------|-------------|
| authenticate() |             |
| redirect()     |             |
| include()      |             |

## Exercise 2.7: Data Analysis and Visualization in Django

### Learning Goals

- Work on elements of two-way communication like creating forms and buttons
- Implement search and visualization (reports/charts) features
- Use QuerySet API, DataFrames (with pandas), and plotting libraries (with matplotlib)

### Reflection Questions

1. Consider your favorite website/application (you can also take CareerFoundry). Think about the various data that your favorite website/application collects. Write down how analyzing the collected data could help the website/application.
2. Read the Django [official documentation on QuerySet API](#). Note down the different ways in which you can evaluate a QuerySet.
3. In the Exercise, you converted your QuerySet to DataFrame. Now do some research on the advantages and disadvantages of QuerySet and DataFrame, and explain the ways in which DataFrame is better for data processing.



## Exercise 2.8: Deploying a Django Project

### Learning Goals

- Enhance user experience and look and feel of your web application using CSS and JS
- Deploy your Django web application on a web server
- Curate project deliverables for your portfolio

### Reflection Questions

1. Explain how you can use CSS and JavaScript in your Django web application.
2. In your own words, explain the steps you'd need to take to deploy your Django web application.
3. (Optional) Connect with a few Django web developers through LinkedIn or any other network. Ask them for their tips on creating a portfolio to showcase Python programming and Django skills. Think about which tips could help you improve your portfolio.
4. You've now finished Achievement 2 and, with it, the whole course! Take a moment to reflect on your learning:
  - a. What went well during this Achievement?
  - b. What's something you're proud of?
  - c. What was the most challenging aspect of this Achievement?
  - d. Did this Achievement meet your expectations? Did it give you the confidence to start working with your new Django skills?

Well done—you've now completed the Learning Journal for the whole course.