

**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?

I am new to the field, before the start of my full-stack immersion I had only designed 1 website using wix.com. Otherwise, I tried to do a small free course on html/css about 15 years ago but

didn't have the mindset at that time. Perseverance will get me through this course, which I learned through life.

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

The only thing I know is that it is commonly used in AI and it is apparently easier to understand than most other languages.

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.

The same challenges that I have faced so far in my Full-Stack Immersion. Things not working as smoothly as intended, me having to figure out what mistakes that I have made and working to get through them. I need to take breaks because I tend to try to just push through things, but breaks are very important. Resting allows the brain to process information.

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?

Frontend development is WHAT a user sees and interacts with on the screen. Backend development is HOW the device operates and responds to the user's interactions. If I were working in a backend development role it depends on the programming language the company tends to use. For example, if the company used JavaScript, then I would likely be working with Node.js on the backend and for Python, Django.

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?

(Hint: refer to the Exercise section "The Benefits of Developing with Python")

"Each language has their pros and cons. Both languages are well supported in the community. As this project begins to grow however, Python's advantage is its ability to remain readable and easy to understand. That means that as we add new developers for the project we can be confident that they will be able to navigate the code easily. Javascript can begin to get complicated as this grows. Also, software is moving in the direction of Artificial Intelligence. Either new software is AI or it will incorporate AI. Not knowing our future, using Python better prepares us to do the same if we ever decide to incorporate AI into our own projects."

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?

My goals are:

1. To really try to understand the language so well that I can create my own project soon after the course.
2. I would love to work in AI in some sort of capacity
3. I want to develop & finish the Achievements with excellence to promote in my portfolio

## 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?

IPython offers a more robust platform from syntax highlighting, code completion, and better visuals.

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?
Tuples	Linear arrays that can store multiple values of any type	Non
Strings	Immutable array of characters both alphanumeric and symbols	Non
Lists	Like Tuples but they are mutable	Non
Dictionaries	Stores values and objects within itself indexed by identifiers, or keys	Non

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.

Tuples and lists are similar however, there are a few key differences:

1. Lists are mutable
  2. Syntax differences- lists use brackets [] and tuples use parentheses ()
  3. Performance: list may require more memory due to their mutability, especially with large data sets
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.

Given the requirement for flexibility and the possibility of extending the application beyond vocabulary memorization, opting for a list of dictionaries appears to be the most fitting data structure. This choice enables effortless addition, removal, or modification of flashcards, and facilitates convenient access to each flashcard's details through meaningful keys.

## 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!*)

```
select_destinations = ['Louisiana', 'Colorado', 'California']

users_choice = input("What state would you like to travel to? ")

if users_choice in select_destinations:
    print(f"Enjoy your stay in {users_choice}")

else:
    print("We're sorry, that destination is not 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 perform logical operations on booleans. There are 3 main operators:

and: Returns True only if both values are true

or: returns True if one value is true

not: returns: return True if the operand is False, and vice versa

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

Functions are blocks of reusable code that perform specific tasks. For instance if I needed to consistently add 2 numbers together throughout a project, then I could create a function to do so and not have to rewrite that code over and over. So functions really help decrease to decrease the amount of code, preventing more tedious and time consuming work.

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.

My main goal is really trying to get better at solving problems with confidence. So, I need to really understand the logic and when to apply what.

## 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?

Without saving files, you couldn't call information to use later. For instance, making a recipe that doesn't save is essentially pointless

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 convert complex data into bytes then write the code in a binary file. That being said, you would use them most frequently when storing complex data. It can also be used for caching and saving the state of an app.

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?

`os.getcwd()` to find out current directory and `os.chdir()` to change 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? You can use the try-except if concerned about potential errors, without terminating the program
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.

Well, I am definitely not proficient at Python yet but I am learning. I know more about it than I did before starting it. Lol So, I am proud that I have a basic understanding of some of Python's nuances.

## 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?  
OOP organizes code into reusable components called classes allowing developers to create larger systems but building on smaller units of code.
2. What are objects and classes in Python? Come up with a real-world example to illustrate how objects and classes work.  
A class is kind of a blue print from creating objects. A class defines methods and attributes. For example a car might have attributes like make, model, year and then have methods like start the engine or drive.
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 like passing down traits or characteristics from one thing to another. In programming, it means a new type of thing (subclass) can automatically get all the abilities and properties of another type of thing (superclass)
Polymorphism	Polymorphism is like putting something in a box and only allowing certain people to access it or change it. In programming, it means bundling together data and the actions that can be done with that data



	into one package.
Operator Overloading	Operator overloading is like having different things that can all do the same thing in their own unique way. In programming, it means treating objects of different types in a similar way, even if they behave differently.

## 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 organized collections of data that allow you to store, retrieve, and manage information efficiently. They offer advantages such as:  
Data Persistence: Data is stored permanently and can be accessed even after the program that created it has finished executing.  
Data Integrity: Databases ensure that data is accurate and consistent.
2. List 3 data types that can be used in MySQL and describe them briefly:

Data type	Definition
INT	Used for storing integers, such as whole numbers without decimals.
VARCHAR	Used for storing variable-length character strings, such as names or addresses.
DATE	Used for storing dates in the format YYYY-MM-DD.

3. In what situations would SQLite be a better choice than MySQL?  
In a situation where simplicity is important: SQLite is lightweight and doesn't require a separate server process, making it easier to set up and use. Also, when it's a single-user or small application: SQLite works well for applications that don't require concurrent access from multiple users

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 is primarily used for front-end web development, while Python is more versatile and can be used for web development, data analysis, artificial intelligence, and more. Also, JavaScript is often used for client-side scripting, while Python is commonly used for server-side scripting.

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 is not as fast as some other languages. This can be a limitation for applications that require high-performance computing. Python can be used for mobile app development but it is not as popular or well-supported as some other languages.

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

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?
- 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?
- 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?

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.