

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 have about one year of coding experience through CareerFoundry. Some of the languages and frameworks I've learned so far include HTML, CSS, SCSS, React, and Angular, among others. These experiences have helped me build a strong foundation in web development and problem-solving, which I believe will be valuable as I continue learning Python.

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

I know that Python is one of the most widely used programming languages and has been around for a long time. I'd like to dive deeper into it and understand how I can apply it to real-world projects in the future – especially for web development, data analysis, or automation.

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 or week that might be favorable to your facing challenges and growing. Plan for how to solve challenges that arise.

I might struggle a bit with learning Python's syntax and debugging at first. To overcome these challenges, I plan to use the student forum, reach out to my tutor, and take advantage of learning resources available online. I'll also make sure to set aside dedicated study time in a quiet space each week. Most importantly, I'll remind myself to ask for help early whenever I feel stuck.

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 is what users see and interact with – like buttons, layouts, and visuals – using tools like HTML, CSS, and JavaScript.

Backend is what happens behind the scenes – managing data, servers, and user logins.

If I worked on the backend, I'd be handling things like building APIs, connecting to databases, and making sure data flows smoothly to the frontend.

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”*)

Both Python and JavaScript are great, but Python feels simpler and easier to read.

JavaScript is great for interactive frontends, while Python is better for backend work and data-heavy projects.

I'd recommend Python because it's clean, beginner-friendly, and has strong frameworks like Django and Flask that make building web apps faster and more secure.

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?

- Get more comfortable writing clean Python code.
- Build small projects to practice backend development.
- Feel confident using Python for real-world web apps and add it to my skill set.

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?**

I'd say iPython is just easier and more fun to use. It has color highlighting, auto-complete, and better error messages. You can also run system commands and test small bits of code quickly—it's like a more powerful and user-friendly version of the regular Python shell.

- 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?
Integer (int)	whole numbers like 10 or -3	scalar
Floating-point number (float)	numbers with decimals like 3.14	scalar
String (str)	sequences of characters like "hello"	scalar
List (list)	an ordered collection of items like [1, 2, 3]	non-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.**

I'd say the main difference is that lists are changeable, and tuples aren't. You can add, remove, or update items in a list, but once a tuple is created, it can't be changed. Lists are more flexible, while tuples are faster and good for storing data that shouldn't be modified.

- 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.

I'd use a dictionary because it lets me store each word as a key and its details—like definition and category—as values. It's organized, easy to update, and perfect for looking things up quickly. If I expand the app later, dictionaries make it simple to add features like tracking progress or grouping words by topic.

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!*)

```
destination = input("Where would you like to travel? ")

if destination.lower() == "paris":
    print("Enjoy your stay in Paris!")
elif destination.lower() == "tokyo":
    print("Enjoy your stay in Tokyo!")
elif destination.lower() == "new york":
    print("Enjoy your stay in New York!")
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 in Python help combine or compare conditions. There are three: and, or, and not. and means both conditions must be true, or means at least one must be true, and not reverses the result. They're super useful when checking multiple things in an if statement.

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

Functions in Python are reusable blocks of code that perform a specific task. They're useful because they help make code cleaner, organized, and easier to debug. Instead of repeating the same code, you can define a function once and call it whenever needed – saving time and reducing errors.

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'm getting more comfortable with Python and the IPython shell, and I'm starting to see how useful they can be in real-world applications. However, I still have some work to do to become truly proficient in Python.

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?**

File storage is important in Python because it lets you save data, settings, and progress so you can use them later. Without storing local files, every time you run your program, you'd lose everything – no saved data, no history, and you'd have to start from scratch each time.

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 in Python are a way to save objects like lists or dictionaries so you can load them later without rebuilding them. I'd use pickles when I need to store data between program runs, like saving user preferences or model data, because it's quick and keeps the original structure intact.

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?

You can use `os.getcwd()` to find out which directory you're currently in. If you want to change your working directory, you can use `os.chdir("path/to/directory")`. These functions are part of the built-in `os` module, which helps you interact with your computer's file system.

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?

I'd use a `try-except` block to handle the error safely. The code that might cause an error goes inside `try`, and if something goes wrong, the `except` block runs instead of crashing the program. This way, the script keeps running even when an error happens.

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.

So far, the course is going really well! I'm becoming more confident with Python and how the different concepts connect. I'm proud that I'm understanding Python faster than in previous achievements—it's really boosted my confidence as a coder and reassures me that I'll be ready for the job once I graduate. I still struggle a bit with debugging and remembering syntax, but with more practice and guidance, I know I'll get there.

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 (OOP) is a way of writing code by organizing it into objects that represent real things, each with their own data and actions. It makes programs easier to understand, reuse, and maintain. With OOP, you can build flexible, organized code using features like classes, inheritance, and encapsulation.

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

In Python, a class is a blueprint that defines the properties and behaviors of something, while an object is a specific instance of that class. For example, if "Dog" is a class with attributes like name and breed, then "my_dog" could be an object representing a real dog named Max.

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 lets one class take on the properties and methods of another. It's like passing traits from a parent to a child. For example, a Car class can inherit from a Vehicle class and reuse its features like <code>start_engine()</code> . This helps keep code cleaner and easier to manage.
Polymorphism	Polymorphism means different objects can use the same method name but act differently. For example, a Dog and Cat class might both have a <code>speak()</code> method – one barks, the other meows. It makes your code flexible and easier to expand without changing what already works.
Operator Overloading	Operator overloading lets you change how built-in operators work for your custom classes. For instance, if you have a Point class, you can make + add two points together instead of just numbers. It keeps your code simple and more readable.

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 systems that store and manage information so it can be easily accessed, updated, and shared. They're great because they keep data consistent, prevent duplication, and make it easier to find what you need quickly. Plus, they help multiple users work with the same data safely and efficiently.

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

Data type	Definition
INT	INT is used for whole numbers like ages or counts
VARCHAR	VARCHAR stores text or strings, such as names or emails, with a defined length.
DATE	DATE is used to store calendar dates in the format YYYY-MM-DD, which is great for tracking events or birthdays.

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

SQLite is a better choice than MySQL when you need a lightweight, simple, and self-contained database. It's great for small projects, testing, or mobile apps because it doesn't require a server setup. Since all data is stored in a single file, it's easy to manage, portable, and perfect for personal or local use.

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?

Python feels more beginner-friendly because of its simple and readable syntax, making code easier to understand since it uses clear words instead of symbols. JavaScript, on the other hand, is mainly used for web development and runs in browsers. It's more event-driven and dynamic, but its syntax can be trickier to grasp at first.

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 great for beginners and really versatile, but it does have some limitations. It can be slower than other languages like Java because it's interpreted rather than compiled. It's also not the best for mobile app development or memory-heavy tasks. Still, its simplicity and huge community make up for most of that.

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

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

An Object Relational Mapper (ORM) is a tool that lets you work with a database using your programming language instead of writing raw SQL. It makes managing data easier, keeps your code cleaner, helps prevent errors, and allows you to switch databases without changing much of your code.

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?

Building the Recipe app went pretty smoothly, and I'm happy with how organized my code and components turned out. I think I did a good job making the UI clean and easy to navigate. If I could start over, I'd slow down a bit to really understand my syntax, but with the time constraints, I had to stick to the schedule.

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 built a recipe management app using Python and SQLAlchemy for MySQL database operations. Users can create, search, edit, and delete recipes with automatic difficulty calculations. I implemented input validation, error handling, and a command-line interface. The search feature lets users find recipes by multiple ingredients using SQL queries. It taught me database design, user experience, and building functional applications.

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 was able to manage my time well.

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

I am particularly proud of my improved understanding of syntax, a significant advancement since the beginning of this course.

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

The most challenging part was learning all this new information in such a short period of time.

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

Yes, this achievement met my expectations. I feel more confident and comfortable with Python now, and I know I'll be able to navigate and work with it more effectively.

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

I want to remember to stay on top of my tasks and manage my time efficiently to do my 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 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 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?

Vanilla Python:

Gives full control over project structure and design.

Slower development since you must build everything from scratch (routing, security, etc.).

Django:

Speeds up development with built-in tools for authentication, databases, and templates.

Less flexibility—you must follow Django's structure and conventions.

2. In your own words, what is the most significant advantage of Model View Template (MVT) architecture over Model View Controller (MVC) architecture?

The biggest advantage of MVT is that it simplifies development—Django automatically handles much of the controller logic through its framework, letting developers focus more on models and templates. This makes MVT easier to use and less error-prone than traditional MVC.

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?**

Learn Django basics — Understand how to build full web applications using models, views, and templates.

- **What do you want to get out of this Achievement?**

Develop real projects — Gain confidence using Django's ORM, authentication, and admin panel.

- **Where or what do you see yourself working on after you complete this Achievement?**

Prepare for real-world work — Be ready to build or contribute to production-level Django web apps after completing 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.)

If I were asked to convert a company's website into Django terms, I'd start by identifying models for the database (like Users, Products, or Posts), create views to handle logic and data display, and design templates for the front-end. I'd also set up URLs for navigation and connect everything through Django's MVT structure.

2. In your own words, describe the steps you would take to deploy a basic Django application locally on your system.

To deploy a Django application locally, I would first create and activate a virtual environment, then install Django. Next, I'd run `django-admin startproject` to create the project structure, execute `python manage.py migrate` for database setup, create a superuser with `createsuperuser`, and finally start the development server using `python manage.py runserver`. This provides a fully functional local Django environment.

3. Do some research about the Django admin site and write down how you'd use it during your web application development.

Django admin is invaluable for rapid development and content management. I use it to manage user accounts, perform CRUD operations on models without building custom interfaces, and quickly test database relationships. It's perfect for client demos, allowing non-technical stakeholders to manage content directly. I also leverage it for debugging data issues and as a foundation before building custom admin interfaces for production applications.

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.**

Django models are Python classes that define the structure of your database tables. Each attribute becomes a field in the database. They make data handling easier because Django automatically creates queries, tables, and relationships for you. The main benefits are less manual SQL, cleaner code, and a consistent way to manage your data across the whole app.

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.**

Writing test cases from the start helps catch bugs early and makes sure new features don’t break old ones. For example, if you’re building a login system, tests can quickly show if password checks or redirects stop working. Starting early saves time, keeps your project stable, and gives you confidence as the code grows.

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.

Django static files are assets like images, CSS, and JavaScript that don't change dynamically. During development, Django serves them automatically from each app's static folder. In production, Django collects all static files into one location using `collectstatic`, so a web server can serve them efficiently.

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	A generic class-based view that displays a list of objects. It uses a queryset (typically all instances of a model) and passes them to a template under <code>object_list</code> (or a custom context name).
DetailView	A generic class-based view that displays a single object. It looks up the object (e.g., by <code>pk</code> or <code>slug</code>) and makes it available in the template as <code>object</code> (or a custom context name).

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.

How is it going?

Excellent progress! Successfully built a complete Django web application with models, views, templates, and comprehensive testing.

What I'm proud of:

Creating a professional Recipe Management System with enhanced features like automatic difficulty calculation, beautiful UI design, stock image integration, and robust test coverage (49 passing tests).

Need more practice with:

Advanced Django features and deployment strategies. I also need to be more fluent when using Django.

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.

Authentication protects user data and ensures only authorized people can access certain features. This is especially important for apps that contain sensitive information such as your social security number, home address, or bank accounts. In these scenarios, authentication is crucial to keep your information safe.

2. In your own words, explain the steps you should take to create a login for your Django web application.

Create a login form, set up a URL and view using Django's built-in authentication methods, verify the user's credentials, and redirect them after a successful login. Then create a template for the login page and update your settings to include the login and logout routes.

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()	Verifies a set of credentials (e.g. <code>username</code> and <code>password</code>) against Django's authentication backends. If they're valid, it returns a <code>User</code> object; otherwise, it returns <code>None</code> .
redirect()	A shortcut that returns an <code>HttpResponseRedirect</code> . It can take a model (using its <code>get_absolute_url()</code>), a view name (which is reversed), or a URL. By default it's a temporary redirect, but you can make it permanent.
include()	Used in URL configurations to include other URLconf modules. Django chops off the part of the URL already matched and delegates the rest to the included URL patterns.

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.