

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

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.

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 works with client facing content. This code provides the UI that is executed in a web browser on the clients computer. It contains all of the styling and visual framework of a web app. It can create components based on user input and by pulling data from the backend. Backend development involves databases, business logic, api endpoints. Backend data is hosted on a server. If I were hired to work on backend programming I would be working on CRUD operations (Create, Read, Update, Delete) with a database. Creating endpoints for a frontend application to interface with.

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")

JavaScript and Python are similar in several respects. They are both scripting languages that are executed line by line. They both have dynamic typing, allowing assignment of different types to a single variable. They both utilize highly 'readable' function keywords. I don't think the question of why Python would be better for a project, over JavaScript, can be appropriately answered with the given information. The applicability of a language for a project depends largely on the scope and goals of said project and that context is absent from this hypothetical situation.

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?

1. Learn the basics of Python
2. Identify its pros/cons vs JavaScript
3. Identify its popular/common use cases.

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 Shell provides a more user friendly UI & UX. Some example of this include 'tab completion', which allows you to easily see which methods are available for a given piece of data, and 'multi-line code indentation', which automatically applies line indentation to multi-line commands.

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: | Integers, Whole numbers negative and positive | Scalar |
| Float: | Decimal numbers | Scalar |
| Str: | Strings, a composition of alphanumeric characters and/or symbols surrounded by single or double quotes | Non-Scalar |

| | | |
|-------|-------------------------------|--------|
| Bool: | Boolean true/false statements | 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 key difference between a tuple and list is their mutable property. Lists are mutable and can be changed/modified after creation while tuples are immutable and can't.

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 believe dictionaries would be most appropriate for this use case. There is no need for sequential ordering of a vocabular list, a mutable structure would be desired for additions/expansions and the data structure would work best in key value pairs.

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 to? ')
destination = destination.upper()

if destination == 'PRINCE EDWARD ISLAND' \
    or destination == 'NEW YORK' \
    or destination == 'COLUMBIA':
    print('Enjoy your stay in', destination + '!')
else:
    print('Sorry that destination is not available at this time.')
```

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 include common mathematical operations such as equal too, greater than, less than, not equal too and combinations of these. Each expression will return a Boolean value of 'true' or 'false'. These statements can also be strung together with the 'and' operator which will evaluate both statements and only return a 'true' value if both statements are true. They can also be strung together with the 'or' operator which will evaluate each statement and return a true value once it finds a 'true' statement and if none of the statements are 'true' it will return a 'false' value.

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

Functions are blocks of code with a keyword. They must be declared first and can contain all variety of lines of code inside them. Once declared they can be called again and again anywhere in the program and execute all of the code inside the function. There use eliminates repetitive code and adds efficiency.

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.

1. Learn the basics of Python

I have learned the basic data types, logical operators, conditional statements, loops, and function calls.

2. Identify its pros/cons vs JavaScript

Python appears to be a less syntax intensive language than JavaScript. I can see how this simplicity would be beneficial for backend data processing and code readability.

3. Identify its popular/common use cases.

I can see why this language is popular for data analysis which would lend itself to backend development and AI.

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?

Data collected while running a script would be destroyed upon completion of the script. This would severely limit the practical use of a script.

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 packages of a stream of bytes that are stored in a binary file. Pickles are useful for storing complex data types like dictionaries.

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?

Directory information can be obtained using the 'os' module. The `os.getcwd()` command returns the current directory. You can change directories by using the `os.chdir()` command.

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?

By using try/except/else blocks you can set up blocks of codes to be executed in the event of a specific error or general error.

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.

This achievement has been informative so far and given me a grasp of the basics of Python. I would not say that I'm proud or any accomplishment at this time because the content has been fairly simple, not necessarily easy, but simple. At this point I have not felt there is a proper opportunity to push my coding past what is being required in each exercise save for a few exception calls.

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 programming model that organizes design around data and objects instead of functions and logic. By creating methods that are related to an object type, 'class', you can repeat operations over several objects with less code.

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

In Python data can be organized into classes and objects. A class can have several defined attributes and methods that apply to it. Within a class several objects can be defined that share the attribute structure and access its methods. An object is a subset of a class. A realworld example of this relationship would be fruits and the different individual 'objects' that are 'classified' as fruits.

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 a class property in python that allows 'child' classes to access attributes and methods of its 'parent' class. This is a one-way data exchange. Child classes can access parent methods but parent classes can NOT access child methods. |
| Polymorphism | Polymorphism is the ability to define a method with a single keyword within multiple classes and produce a different result based upon the definition of that method within each class. |
| Operator Overloading | Operator overloading is the process by which the typical mathematical operators (+, -, *, /, ect) are defined inside of a class method. These operators are accessed with predefined keys and can contain any code you like but it is best practice to program them as they typically operate. |

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

| Data type | Definition |
|-----------|------------|
| | |
| | |
| | |

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

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 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?
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.