

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 is working on client-side applications. What does the app look like and what is its function? With frontend, you would be working with frameworks, like React and Angular, and different libraries, like Bootstrap to make the web pages responsive and organized nicely. Backend is what happens behind the scenes that most people don't think about and have no idea it actually exists (at least I didn't before I started this course). This is the server-side. The API which talks to the application and sends responses to the requests for data that is stored in a database. This is also the security side where the user's password and information is kept secure.

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")

There are many reasons as to why Python would be a better choice for this project than Javascript. Firstly, it is simply and easier code to both read and write. This will make our code cleaner with less errors and more people will be able to understand the code on some level. Python also comes with many packages pre-installed and it supports the installation of many other packages. Also pre-installed are common web operations such as URL routing, form handling and validations, and database connections. Overall, I believe that Python would be the better choice for this project.

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?

Goal 1 - To take my time and really learn the language, rather than moving quickly through exercises.

Goal 2 - Learn MySQL so I can make an informed decision between whether to use relational or non-relational databases in the future.

Goal 3 - Just to be able to code in more than one language.

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 iPython shell is preferable over the default Python shell due to its ability to highlight syntax to make it easier to read, it indents automatically, and it allows you to test small chunks of code. For some reason, I have been using the default Python shell but will switch over to iPython for the reasons that I have just listed.

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	Can store multiple values of any type and are immutable	Non-scalar
Lists	Can also store multiple values of any type but are mutable	Non-scalar
Dictionaries	Like an object in JavaScript. Stores key:value	Non-scalar
Float	Holds one value and is a decimal	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.

Lists and tuples both have the ability to store multiple values. The differences are that with a list, the values are contained between square brackets and is mutable, meaning you can change the values. On the other hand, a tuple's values are contained between parenthesis and immutable, you cannot change the values.

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.

It seems that storing the foreign language vocabulary in a dictionary would be the best choice. I can immediately see how key:value pairs will be needed to organize the information. The user could study all parts of the words (words, definitions, categories) or pull out one of the key values and create a list for targeted study, such as quizzing themselves on just the category for each word. So I suppose my final answer would be to use both dictionaries and lists.

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!*)

```

destinations = ['Singapore', 'Vancouver', 'London']

location = input('Where would you like to travel?')
for location in destinations:
    if location == 'Singapore':
        print('Enjoy your stay in Singapore!')
        break
    elif location == 'Vancouver':
        print('Enjoy your stay in Vancouver!')
        break
    elif location == 'London':
        print('Enjoy your stay in London!')
        break
    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 when you have multiple conditions to check for and you want 'true' or 'false' returned. You can use operators such as 'and', 'or', or 'not.' When using 'and', if the conditions are not met, 'false' will be returned and if both or all conditions are met, 'true' will be returned. When using 'or' only one condition has to be true to return 'true'. If neither is true, 'false', will be returned. When considering the 'not' operator, if both conditions are true, the result will be 'true.' Any other combination will result in 'false' being returned; true/false or false/false.

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

Functions are blocks of code that give instructions to achieve a desired result. They are useful when you would like to run the same code repeatedly. With a function, you only have to type the 'instructions' once, not every place in your code because of this, your code is clean and concise.

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 am progressing toward goal 1 pretty well. I'm taking my time and making sure I really understand the information before moving on. I am consistently reviewing the information with Anki cards that

I make while doing the readings and am feeling much more confident in my knowledge.

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?

It is inherently important to be able to save data after closing a file. In Python, file storage is important to be able to both read data from files and write data to files. Without file storage, all the data would be lost.

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 a packaged stream of bytes and then convert the bytes into a binary file. You would choose to use a pickle if you wanted to retain the structure of your data in the form of regular text.

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()` tells you which directory you are currently working on.

`os.chdir('path to desired folder')` allows you to change directories.

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 would write a 'try/except' block in my code so the user can be notified if there is an error in the code.

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.

I am enjoying the course. Python is a bit easier to understand than JavaScript but using the command line for everything has been a learning curve. I am excited to learn about databases in Python since I enjoyed working with data using PostgreSQL in the full-stack course.

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 allows you to build classes and methods to keep your code efficient and non-repetitive.

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

Pretty much everything in Python is an object. Objects contain data in lists, tuples, dictionaries, strings, integers, etc. Classes are templates for creating objects.

I think of classes and objects as being like Russian Nesting Dolls. The largest one is the class, it holds the object, and when you open the object doll, there's fun stuff inside (data).

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 when there is a 'parent' class and it passes down attributes that a 'child' class can use, rather than recreating the attributes.
Polymorphism	Polymorphism is the ability of one object to take on many forms. It has the same name but may perform differently depending on where it is defined.
Operator Overloading	Operator overloading is defining a function for an operator that can be used for different tasks. For example, '+' can be used to concatenate or add numbers so you would define a function called 'def __add__()'

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 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.