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)

* 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?
* What do you know about Python already? What do you want to know?
* 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](https://careerfoundry.com/en/steps/your-cf-team#receiving-support) 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

* 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 backend is how things interact. For example what a button does. If I was working on the backend I would expect to create functions that pull information from a database and work with an API.**
* 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”)* **I would explain how much faster python would be, which would mean a more optimized project. Python is also easier to read and debug. If someone can write JS, then they can easily learn python.**

* 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?  
    
   **Going through a python book got me into programming, so I would want to know when python would be a good choice for a project. I would also want to learn more complex uses of python and some frameworks. Lastly I want the skills I learn here to look good for an employer.**

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

* 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 easier to use because it will have different colors, fonts, and has cleaner text. IPython will give more guidence as you type your code. It also indents by itself.**
* 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 | A whole number integer | Scalar |
| float | A decimal number | Scalar |
| str | A sting of characters | Non-Scalar |
| bool | A true or false statement | Scalar |

* 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 are good for storing values in a linear array. Lists can be agumented in multiple ways making them mutable.**
* 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 think a tuple would work just fine with flashcards because the words will not need to change.**

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

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

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

|  |
| --- |
| travel\_to = input("Would you like to go to Rome, London, or Costa Rica?: ")  if travel\_to = "Rome":  print("Enjoy your stay in ['travel\_to']  elif travel\_to = "London":  print("Enjoy your stay in ['travel\_to']  elif travel\_to = "Costa Rica":  print("Enjoy your stay in ['travel\_to]  else:  print("Oops, that destination is not currently available.") |

* 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 less than, greater than, less than or equal to, and greater than or equal to.**
* What are functions in Python? When and why are they useful?  
    
  **Functions are several lines of code only to be used when called upon. They are useful for complex logical responses based on input.**
* 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.  
    
  check

Exercise 1.4: File Handling in Python

Learning Goals

* Use files to store and retrieve data in Python

Reflection Questions

* Why is file storage important when you’re using Python? What would happen if you didn’t store local files?  
    
  **The script would run like it was first time. Storing files opens the door for scripts that can use that data.**
* In this Exercise you learned about the pickling process with the **pickle.dump()** method. What are pickles? In which situations would you choose to use pickles and why?   
    
  **Pickles are binary files that only a computer can read. This makes it a great option for large files because in a pickle it doesn't take much space.**
* 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?  
    
  **pwd will should your current directory and cd lets you change directories.**
* 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?  
    
  **using try and expect blocks with proper error messages can help you figure out what is failing and why.**
* 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.   
    
  **getting python up and running in a virtual environment took a bit of extra work and I was happy I was able to get it done. Using pickles was the first time I wrote a script that stored information.**

Exercise 1.5: Object-Oriented Programming in Python

Learning Goals

* Apply object-oriented programming concepts to your Recipe app

Reflection Questions

* In your own words, what is object-oriented programming? What are the benefits of OOP?  
  **OOP is a development method that focuses on using created objects rather than functions and logic**
* What are objects and classes in Python? Come up with a real-world example to illustrate how objects and classes work.  
  **Everything in python is an object like strings or integers. A class can contain many objects. for example defining a class called Date and that class holds objects that define day time and year.**
* In your own words, write brief explanations of the following OOP concepts; 100 to 200 words per method is fine.

|  |  |
| --- | --- |
| **Method** | **Description** |
| Inheritance | instead of coding the same thing multiple times python allows inheritance to keep methods to use between classes. |
| Polymorphism | a data attribute or method has the same name across different classes or data types but performs different operation depending on where it is. |
| Operator Overloading | using operators like the '+' symbol will give a type error in a custom class but you can use \_\_add\_\_() to define it and use it in that custom class. |

Exercise 1.6: Connecting to Databases in Python

Learning Goals

* Create a MySQL database for your Recipe app

Reflection Questions

* What are databases and what are the advantages of using them?  
  Databases hold and keep information organized. This lets python scripts connect and used saved information on the database instead of starting fresh everytime. Having an email account is stored on a database and that information is pulled when signing in, instead of creating a new email every time.
* List 3 data types that can be used in MySQL and describe them briefly:

|  |  |
| --- | --- |
| **Data type** | **Definition** |
| VARCHAR(n) | string of variable length, with n representing the maximum nubmer of characters |
| FLOAT | Floating-point decimal numbers |
| INT | Standard integers |

* In what situations would SQLite be a better choice than MySQL?  
  **SQLite is good for simple shop pages for example. the customers have their emails stored on a database but it doesn't need an entire database engine.**
* Think back to what you learned in the Immersion course. What do you think about the differences between JavaScript and Python as programming languages?  
  **I feel like JS is an easy standard to use and has lots of flexiblity and documentation. Python is good for smaller simplier tasks especially task that have a lot of repetition. You can make a script and automate a lot of work with python**
* 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?  
  **It has high memory consumption and is weak on mobile development.**

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 ORM is a software tool that lets developers interact with their realational databases. It bridges OOP and the database. Some advatages are faster development time, improved security, and decrease the amount of code needed.**
* 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?  
  **During the development of it I had a feeling that there had to be a better faster way to go about it, which is where django comes in and it definitely helps. But any project requiring more control or customization this process would be required and even then it's pretty simple. It's easy to interact with and to build.**
* Imagine you’re at a job interview. You’re asked what experience you have creating an app using Python. Taking your work for this Achievement as an example, draft how you would respond to this question.  
  **I have a recipe app that uses an ORM, specifically SQLAlchemy, and it shows off creating a simple app that interacts with a database.**

* You’ve finished Achievement 1! Before moving on to Achievement 2, take a moment to reflect on your learning in the course so far:
* What went well during this Achievement? **Setting up things like the VE, database, ORM, and problem sovling my bugs**
* What’s something you’re proud of? **When I asked for help I was told where to look and then I was able to take care of the rest and fix everything mostly on my own.**
* What was the most challenging aspect of this Achievement? **weirdly getting access to my server in the SQL workbench. fixing the bugs through this achievement felt good and I was able to make progress everytime I worked on something.**
* Did this Achievement meet your expectations? Did it give you the confidence to start working with your new Python skills? **It helped me deepen my understanding and confidence in python. All my skills are being used and I can feel my growth.**
* What’s something you want to keep in mind to help you do your best in Achievement 2? **I'm ready for the metaphorical doors to be blown off with django.**

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](https://careerfoundry.com/en/steps/your-cf-team#receiving-support) 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

* 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 would be great on a small custom job that requires alot of control over its structure. On a bigger project it would be good to use Django for its fast startup, solid structure, and built in security.**
* In your own words, what is the most significant advantage of Model View Template (MVT) architecture over Model View Controller (MVC) architecture?  
  **MVT goes well with the DRY method and lets the developer reuse apps accross projects to reduce repetitive code.**
* 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?   
  **How to start projects easily**
* What do you want to get out of this Achievement?   
  **I want to learn how to use Django and use that knowledge for future projects were applicable.**
* Where or what do you see yourself working on after you complete this Achievement?  
  **I have a beginner python book and I want to go back to some of those early projects and see how far I've gone and how I can improve and build upon those projects.**

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

* 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.*)  
**I would show case the the use of projects and apps and how Django would allow them to reuse apps across projects.**

* In your own words, describe the steps you would take to deploy a basic Django application locally on your system.   
  **I would have python installed and then in my terminal create a virtual evnironment where I would install Django. Then I would start building the basic structure of my projects with commands like py manage.py startapp "name"**
* Do some research about the Django admin site and write down how you’d use it during your web application development.  
  **Being the admin I will be able to use CRUD.**

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

* Do some research on Django models. In your own words, write down how Django models work and what their benefits are.
* 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

* Do some research on Django views. In your own words, use an example to explain how Django views work.
* 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?
* Read Django’s documentation on the [Django template language](https://docs.djangoproject.com/en/3.2/ref/templates/language/#templates) 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

* In your own words, explain Django static files and how Django handles them.
* 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 |  |

* 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

* In your own words, write down the importance of incorporating authentication into an application. You can take an example application to explain your answer.
* In your own words, explain the steps you should take to create a login for your Django web application.
* 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

* 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.
* Read the [Django HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK "https://docs.djangoproject.com/en/3.2/ref/models/querysets/" HYPERLINK 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Note down the different ways in which you can evaluate a QuerySet.
* 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

* Explain how you can use CSS and JavaScript in your Django web application.
* In your own words, explain the steps you’d need to take to deploy your Django web application.
* (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.
* You’ve now finished Achievement 2 and, with it, the whole course! Take a moment to reflect on your learning:
* What went well during this Achievement?
* What’s something you’re proud of?
* What was the most challenging aspect of this Achievement?
* 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.