

# Astronomy 19 Code Journal #1 Weeks 1-3

Due via Canvas on January 26, 2023 by 5pm

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During Unit #1 of Astronomy 19, we will be learning the basics of the [Python](#) programming language and applying those skills to introductory topics in the statistical analysis of scientific data. This Code Journal will help you track your progress in learning Python during the first three weeks of the quarter.

Below, you will find small exercise prompts to write programs in Python. These programs should be added to your Astronomy 19 repository on GitHub. Once you add each program to GitHub, you will copy the URL of the program source from GitHub and paste inline under the prompt. Write 2-3 sentences about what you learned in completing each prompt. If you need help, refer to the slide deck showing an example of how to find the URL of the program on GitHub or contact your TA or instructor.

**1) Session 1 Prompt:** Write a Python program to print out your full name, your preferred pronouns (optional), and two sentences about your favorite movie and your favorite food.

**GitHub URL:** <https://github.com/LeoRicchie/ASTR-19/upload>

**[WRITE A BRIEF SUMMARY (2-3 SENTENCES) OF WHAT YOU LEARNED HERE]** I learned my first function of code in Python! I learned how to print text by using the `print()` function, and also that you can input a large amount of text into the line and not just small things like “Hello World”.

**2) Session 2 Prompt:** Write a Python program that prints the sum of two floating point numbers, the difference between two integers, and the product of a floating point number and an integer. In each case, have the program print out the data type of the resulting answer.

**GitHub URL:**      <https://github.com/LeoRicchie/ASTR-19/upload>

**[WRITE A BRIEF SUMMARY (2-3 SENTENCES) OF WHAT YOU LEARNED HERE]** Although I needed to watch some YouTube videos and use google to help me, I learned a few ways to calculate numbers such as finding the sum, the difference, or the product. I also learned what a float point number is. I did use chat GPT to find out why my code wasn't going into my terminal but it ended up being a spelling mistake. Even though these are simple tasks compared to some, it feels great to get some cool things done with python.

**3) Session 3 Prompt:** Write a Python program that defines a function  $f(x)$  that returns  $x^3 + 8$ . In the main function of the program, call  $f(x)$  with  $x = 9$  and print the result. Use an if statement that executes if the result is larger than 27 and prints "YAY!".

**GitHub URL:**      <https://github.com/LeoRicchie/ASTR-19/upload>

**[WRITE A BRIEF SUMMARY (2-3 SENTENCES) OF WHAT YOU LEARNED HERE]** With this prompt I got a little more practice with "if" statements as well as just some overall practice of some old methods we learned. I also learned how frustrating making typos can be, I tried running my code like 8 times and every error was a spelling mistake, haha.

**4) Session 4 Prompt:** Write a Python program that declares a class describing your favorite animal. Have the data members of the class represent the following physical parameters of the animal: length of the arms (float), length of the legs (float), number of eyes (int), does it have a tail? (bool), is it furry? (bool). Write an initialization function that sets the

values of the data members when an instance of the class is created. Write a member function of the class to print out and describe the data members representing the physical characteristics of the animal.

<b>GitHub URL:</b> <a href="https://github.com/LeoRicchie/ASTR-19/upload">https://github.com/LeoRicchie/ASTR-19/upload</a>
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**[WRITE A BRIEF SUMMARY (2-3 SENTENCES) OF WHAT YOU LEARNED HERE]** With this prompt I learned about “bool” functions. I also learned about “int” functions. I got some more experience using the describe function. I did run my code through chat gpt to see what was wrong with it because my module was not saying what was wrong with it.

**5) Session 5 Prompt:** Write a Python program that writes out a table of the function  $\sin(x)$  vs.  $x$ , where  $x$  is tabulated between 0 and  $2\pi$  with a thousand entries. Follow the basic Python program structure, including a main program function.

<b>GitHub URL:</b> <a href="https://github.com/LeoRicchie/ASTR-19/upload">https://github.com/LeoRicchie/ASTR-19/upload</a>
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**[WRITE A BRIEF SUMMARY (2-3 SENTENCES) OF WHAT YOU LEARNED HERE]** This code was pretty hard for me. I was able to write the basic commands of it but I watched YouTube and asked chat gpt to help me with one of the more detailed parts:  
`print(f'{'x':<10}{'sin(x)':<15}')`. I know this is probably not hard but I have never touched code before this class and needed a little extra help.

**6) Session 6 Prompt:** Create a Jupyter Notebook where, in separate cells, you define functions that return  $\sin(x)$  and  $\cos(x)$ . Use Markdown cells to comment your Notebook, and describe what each function does. Create a third Python cell that will tabulate  $\sin(x)$  and  $\cos(x)$  using these previously defined functions vs.  $x$ , where  $x$  is tabulated between 0 and  $2\pi$  with a thousand entries. Write a fourth Python cell that will use a for loop to print out the first 10 values of  $x$ ,  $\sin(x)$ , and  $\cos(x)$  in columns.

<b>GitHub URL:</b> <a href="https://github.com/LeoRicchie/ASTR-19/upload">https://github.com/LeoRicchie/ASTR-19/upload</a>
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**[WRITE A BRIEF SUMMARY (2-3 SENTENCES) OF WHAT YOU LEARNED HERE]** To be completely honest I needed heavy assistance from outside sources like Ai, youtube, and friends to help me with this prompt. I had a hard time understanding these concepts when they were explained to me in the lecture and I still do now. I am starting to understand these concepts but was not able to completely master them by myself before this deadline unfortunately.