



Minor Challenge Set #2

STEM Field: Software Engineering

Level: Intermediate

Challenge Name: An Introduction to Python Programming

Project cost: 0 USD

Materials required:

- Access to a computer with internet

Duration:

- The challenge take approximately 2 hours to finish, however, the time guideline is an estimation only, and students and mentors can complete the tasks around their schedules
- Students do not have to complete all tutorials in one sitting. It can be overwhelming trying to learn all the programming concepts on the platform in one go, so we recommend taking short breaks between the tutorials!

Introduction:

Python is a very practical programming language, and is widely used. A programming language is a special set of instructions given to the computer to run. Python has a lot of functionality built in which makes it a great programming language to learn! You can download Python as well as a text editor onto your computer, or you can use an online programming environment.

In this project, we will be learning and writing some Python code on an online platform called Trinket. After learning the basics of Python programming, you can write your own Python code on an online

programming environment called Replit.

Instructions:


1. Navigate to the website below on your computer. It is recommended you use a browser such as Chrome.

<https://hourofpython.trinket.io/a-visual-introduction-to-python#/welcome/an-hour-of-code>


This is a free learning platform and registration for an account is not required.

Note: You will see a lot of new codes in this project. Don't feel overwhelmed! It takes time and practice to get used to reading and writing codes (which are instructions for computers to run). Good luck and have fun!

Hint: As you work through the tutorials, in each coding panel, you


can click on the button  to view the code in full screen, download the code, or reset the code if you run into any errors.

2. Scroll down until you see the heading "Run your first program!".

Click on the button . Here the computer will read the code, compile, then run the output.


3. On the left hand side of the platform, you will see a list of tutorials available. Click on "Meet Tina" – this will be the first tutorial you will work on.


Welcome!


 An Hour of Code


Turtles!


 Meet Tina


 Moving

 Saying Hello

 Color

 Tina's pen

 Tina's grid

 Going in Circles

4. Work through all the tutorials until you have finished the section called “Functions”. Your last tutorial will be “Say hello!” By the end of this tutorial, you have learned some very important concepts in Python programming: loops, lists, import modules, if-else statements, and functions.
5. Navigate to the section called “Share Your Progress!” Customise the code using what you have learned in the tutorials and click Run! We recommend trying to apply as many concepts you learned as possible, as this will help you get more familiar with writing code in Python.

Note: There are no restrictions to how you can modify the existing code. Be creative!

Extension:

You can do an open-ended exercise in the section called “Put it all together”, or both! Or, you may like to check out the Minor Challenge Software Engineering Senior project to learn how to program a simple game using Python!

Reflection Questions:

- Are there any improvements you would make to this challenge?
- What are the key concepts of science and engineering that relate to this challenge?
- Is Python your first programming language? If so, how did you find the learning process? If not, do you find learning Python more difficult than other programming languages you learned before?
- What are some real-life applications of Python programming?
- From your own research, can you describe 3-5 benefits of programming in Python?
- Can you describe 3 limitations of programming in Python, compared to other programming languages?

Submission Guidelines:

- Submit your final code in a Word document or a text editor, and photos of the output of your code. If you attempted the extension task, submit your code and photos of the output. Include a short summary that addresses the Reflection Questions.

Note: When submitting this Minor Challenge, please upload pictures of your project or experimental setup. Remember, if you want to upload pictures of your Minor Challenge that also include you, please check if it is OK with your mentor first.

- There is a submission form directly on the Minor Challenge page here:
<https://sciencechallenge.org.au/index.php/minor-challenges/>.
Fill out the details and make sure you upload your submission.

Learn More! Resources:

- CodeCombat is a fun and interactive learning platform. You can learn other programming concepts, how to code in Python, JavaScript, and HTML. It is a free website and no registration is required. (Select Student, then choose “No Class Code”).

<https://codecombat.com/play?classCode=>

Sources:

- trinket.io. 2022. *A Visual Introduction to Python*. [online] Available at: <<https://hourofpython.trinket.io/a-visual-introduction-to-python#/welcome/an-hour-of-code>> [Accessed 8 February 2022].