Activity 3.2.2

Social Media: Posting Objects

Distance Learning Support

Check with your teacher about:

- ☐ Materials or resources you need for this activity
- ☐ What work you need to turn in and how to submit it
- ☐ Collaboration strategies

GOALS

- Learn to create, manipulate, and access lists in *Python*
- Pair program to develop a program that solves a problem and generates understanding

TASKS DESCRIPTION

"Francisco, I need a credit in Digital Citizenship to graduate. My faculty advisor said I could implement a social media platform as a Python program to show I understand how they use data." You're hopeful that this will be a fun way to think about digital communities in a different way.

"Whoa! That sounds like a very big project. We can do some little pieces in Python. Some data storage, logic, but the whole thing would require a big team!" Francisco is emphatic.

"When I see a big project idea like this, I like to make sure I first know how the programming skills that go into it work. I have this little guessing game you should check out and modify. It's a good example of defining and calling functions. After that, we can talk about object-oriented programming ideas. Here, let me show you," Francisco pulls up a Python program on his computer.

Modify a program that posts messages and gets posts to understand how social media works.

ESSENTIAL QUESTION

1. What are some essential operations you do over and over with lists or collections?

ESSENTIAL CONCEPTS

- Classes and Objects
- Lists and Elements
- Data and Information

RESOURCES

Debugging Guide

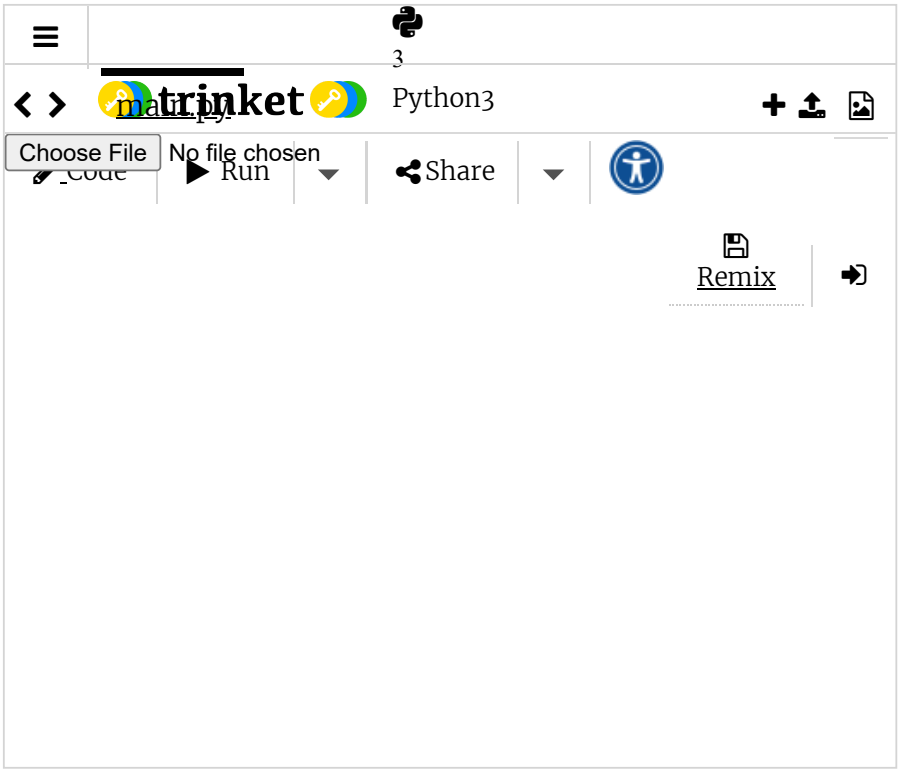
User-Generated Functions

You have already used functions like `print` and `type`, but how are these functions created in *Python*? Just like `if` statements, functions are considered blocks of code. The way you create a function in *Python* is by using the keyword `def`.

```
def function_name(argument1, argument2):
  # what the function will do when it is called
```

Functions can be created to take no arguments, one argument, or several arguments. It all depends on what you want the function to do. Usually, a function is created when you want to reuse code.

1 Review the code for a guessing game.



- What is the function in this code?

Check your answer

- How many arguments does the function take?

  Check your answer

- How many times is the function called?

  Check your answer

- How does the function shorten the code?

  Check your answer

`import random`: You may have noticed the first line of code is `import random`. This line of code allows the program to use all the functions of the `random` module. The function used in the code is described in the table below, which will return a random number between a and b.

`random` module function	
`randint(a,b)`	Returns a random number between two integers `a` and `b`

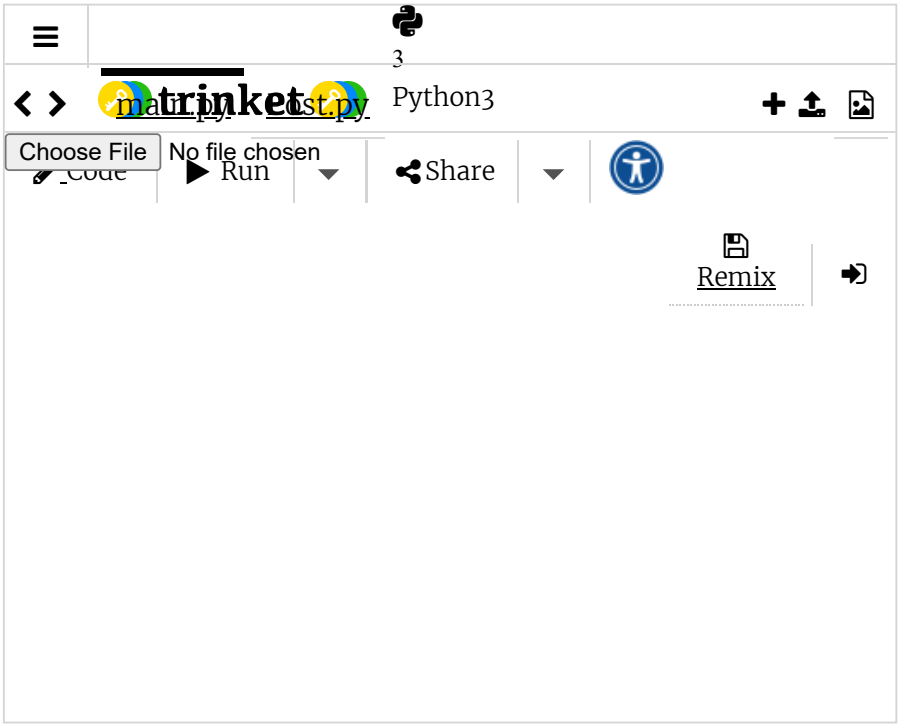
There are many other modules you can import. You will see more imports as you continue this course.

Classes and Objects

In the last activity, you had a brief introduction to classes and objects. Recall that objects are made from classes. Classes are special because they represent data types that can have data and behaviors (or methods) associated with them.

The syntax for a class in *Python* is slightly different from the *Python* coding you have seen so far. To better understand the syntax of a class in *Python*, you will work with the `Post` class that represents a social media post.

2 Select the *Post.py* tab in the embedded code editor below and review the Post class.



- What looks familiar in this code?

  What is familiar?

- What is new that you haven't seen before?

  What is new?

Programming Tip: Whenever you look at a new program, you should take some time to read through the code. Doing this will help you identify the parts of the code that you understand and the parts that you don't. This way, you can learn the parts you are unfamiliar with before using the code.

Now that you have seen what `Post` looks like, it's time to understand the structure of the `Post` class.

- The first line, `class Post`, prepares the file to be a class. This means anything after this line, that is properly indented, will belong to all `Post` objects.
- The next line, `post_id = 0`, is a class variable. This means that all Posts will have a `post_id`.
- The next few lines are class functions called **methods**. These methods are the behaviors associated with all Posts.

`Post` class methods	
`__init__`	Initializes a Post object. This method must exist in every *Python* class.
__str__	Returns a string with all the information of the post.
`set_message(msg)`	Sets the variable `message` to the string `msg`.
`get_user_name(usr)`	Returns the username associated with the post.
`get_post_id`	Returns the ID number of the post.

- Finally, the word `self` is used throughout a class. `self` represents the `Post` object "itself". It binds all the data (`message`, `user_name`, `timestamp`, and `post_id`) and methods (`__init__`, `__str__`, `set_message`, `get_user_name`, and `get_post`) associated with a `Post` into that one variable, `self`.

This is a complicated concept, so don't worry if you still don't understand it.

> **PLTW COMPUTER SCIENCE NOTEBOOK** - Post Code Summary
> Summarize the code contained in the *Post.py* file. Practice using abstraction to your advantage by just focusing on the comments and ignoring implementation details.

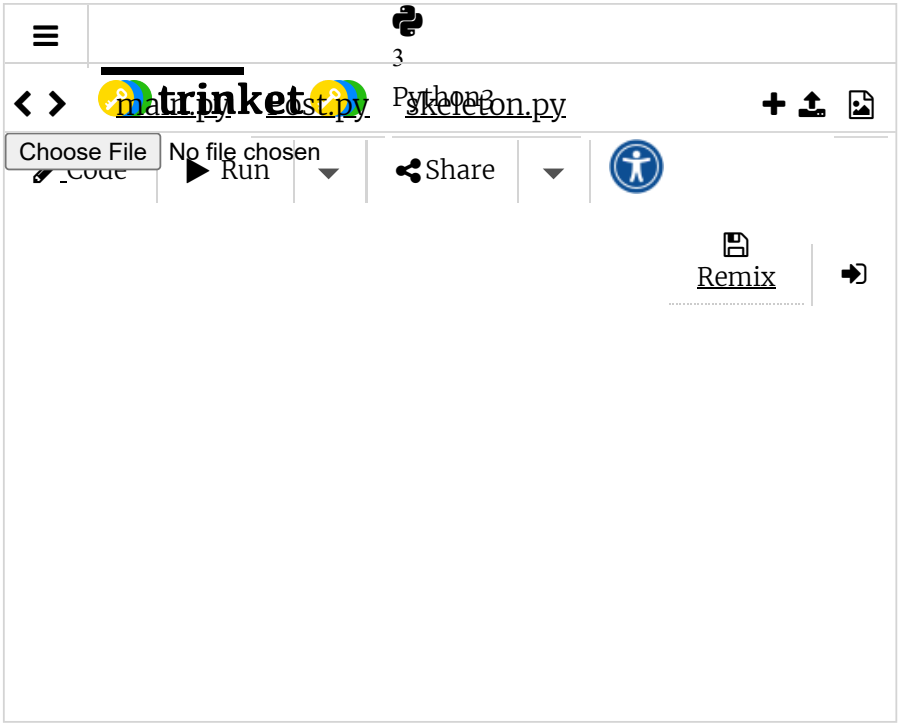
Object Oriented Programming (OOP)

The Post class is an example of **object-oriented programming (OOP)**, which focuses on objects that contain specific data and functions together. A **class** outlines the properties of that object. In turn, the **object** is an instance or example of data that fits the properties of a class.

Another way to consider the object-oriented concept outside of the computer science world is with building a house:

- The class is the blueprint for the house. Many houses may be built using the same blueprint.
- The object is any house built from that template.

3. Add the code `post1 = Post("Marie", "This is my first post!")` just after the comment `# your code here`



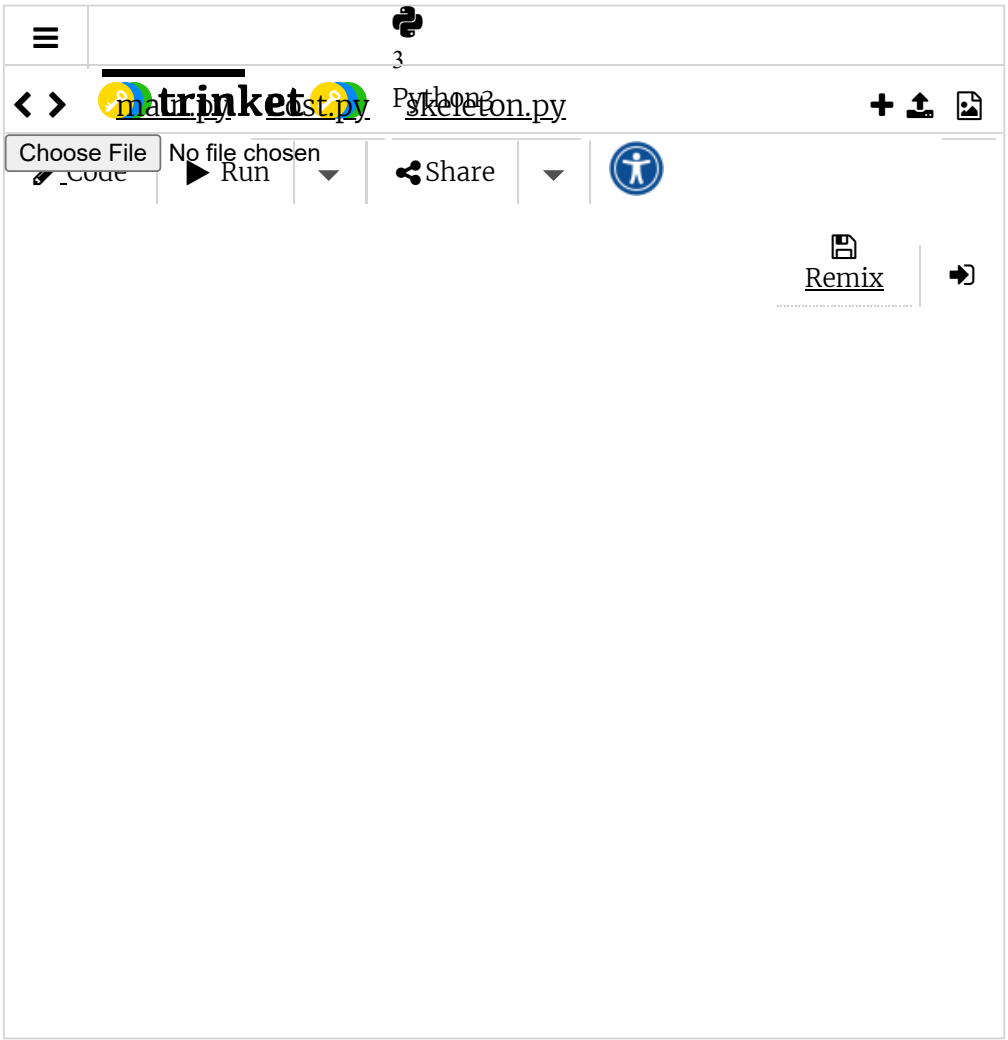
4. Add a `print` statement to print `post1` and run your code.
5. Create two more posts with different users and messages. Run your code.
6. Save your code as directed by your teacher.

Congratulations, you just created your first instance of the class `Post`! Using Object-Oriented Programming is a milestone that should be celebrated.

Looping for Repetition

Now that you know how to create an instance of a `Post`, you are ready to add more functionality to the *main.py* file. The goal for this section is to mimic the process of posting messages on a social media profile after the user is logged on. This program provides very limited functionality and is not connected to any website, but the concept is the same.

> **Note**: There are many steps to this program. Your teacher may direct you to use your AWS Academy account to complete this project. For instructions on how to create an AWS Academy account and a Cloud9 workspace, refer to the **AWS Academy and Cloud9** resource in the General Student Resources.



7. Create a variable `username` and prompt the user to enter a username.

8. Display a message welcoming the user to their profile.

Hint

9 Create a variable `user_input` and prompt the user to enter a decision. The user's options are as follows:

- new - Add a post to the archive
- remove - Remove a post from the archive
- change user - Change their username associated with future posts
- print - Display the current, up-to-date list of all posts
- quit - End the program

Hint

After you prompt the user to enter a decision, use a loop to allow the user to keep entering posts. You can use a `while` loop for this. The syntax for a `while` loop is as follows.

```
while (user_input != "quit"):
  # what will happen if the user doesn't enter quit
  # Notice this is tabbed over. This represents the body of
  # the while loop.
```

10 Add a `while` loop after prompting the user to enter a decision.

a. In the body of the while loop, add `if/elif/else` statements to check the user's decision. Use the following notes as a guide for what the user's decisions mean.

User's Decisions	How to code it.
new	• Create an instance of a new post. • Add it to the all post archive.
remove	• Ask the user which post they want to remove (You will need an index). To remove a list item with an index, use: i. `del all_posts_archive[index]` ii. To check whether the index number is valid, use the `len()` function. • Remove the post from the all post archive.
change user	Change the value of the username variable.

print	Print the all post archive. You can use the following code to print each element in the list:
	`for post in all_post_archive:`
	`  print(post)`

quit	Nothing happens; just let the program end.

b. Prompt the user to enter a decision again. You can copy and paste the code you used earlier.

11 Sometimes coding errors cause an error that impacts the terminal that you are testing your code in, such as your AWS Academy Cloud9 workspace. Occasionally, it might be helpful to take some of the following steps:

a. Close and restart the terminal sessions you need.
b. Save and restart your IDE.
c. Review the Debugging Guide.

Debugging Guide 〉

12 When you have completed your code, let your teacher know.

ETHICAL SCENARIO

In Unit 1, you reflected on contributions to a digital community and who is responsible for those contributions. In that case, you considered the abuse of the cs-api web server endpoint to create offensive user names or data elements. The web API that you used in that activity is limited in scope and not widely visible unless people know what to look for.

On the other hand, social media platforms are far-reaching, and users may be exposed to content that could be considered harmful, inaccurate, misleading, or offensive whether they want to see it or not.

Francisco pulls you aside after class one day and shows you his phone. The screen displays a post from a user account you recognize and the message... oh, it's not good. Someone you know has written this post to specifically target and hurt Francisco and his family. He says, "I moved here from Guatemala when my mother got a cybersecurity job at a local firm. The opportunities here are so good and not enough skilled workers to fill the jobs. Why would someone say something like this?" A student at your school had made a racist post on a social media platform outside of school hours from a home computer.

- Who does this post impact?
- Who is responsible for the impact of this post?
- Should this kind of post be allowed?
- What action should be taken in response, and by whom?

CONCLUSION

1. Describe a metaphor that highlights the relationship between the concepts of classes and objects.
2. What ethical considerations arise from the requirements for this program?
3. How did you interpret and respond to the **Essential Question**? Capture your thoughts for future conversations.

Proceed to next activity