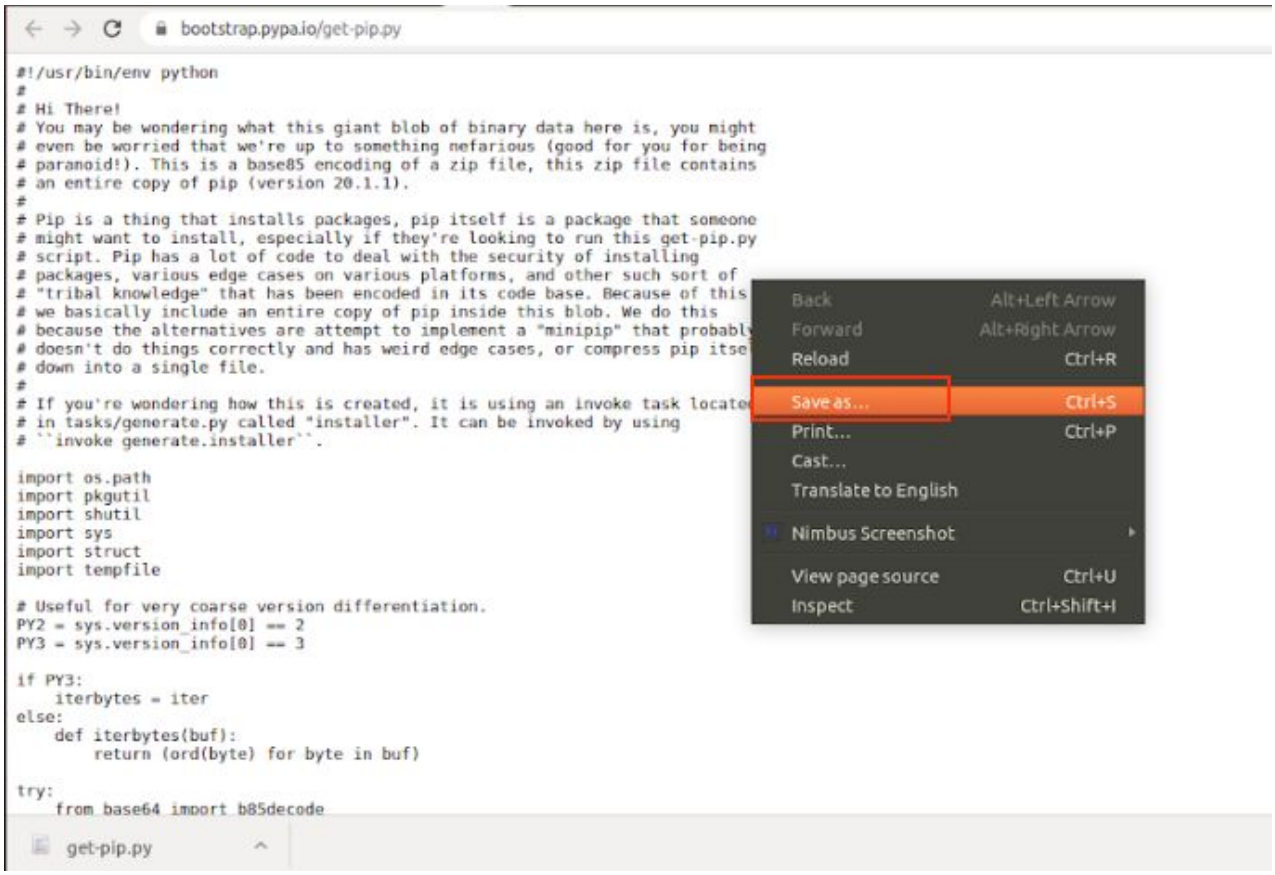
Topic	Package Manager in Python (pip)	
Class Description	**Student learns about package installer in python3 - pip. Student uses howdoi python package to ask questions about python. Student learns about functions, dictionaries, classes and objects by asking questions using howdoi**	
Class	**C100**	
Class time	**45 mins**	
Goal	● Install Python Package Manager - Pip ● Install and use howdoi package manager using pip ● Use howdoi to ask questions to python and learn more about how functions, dictionaries, classes and objects are used in python	
Resources Required	● Teacher Resources ○ Visual Code studio ○ Laptop with internet connectivity ○ Earphones with mic ○ Notebook and pen ● Student Resources ○ Visual Code studio ○ Laptop with internet connectivity ○ Earphones with mic ○ Notebook and pen	
Class structure	**Warm Up Teacher-led Activity Student-led Activity Wrap up**	**5 mins 15 min 15 min 5 min**

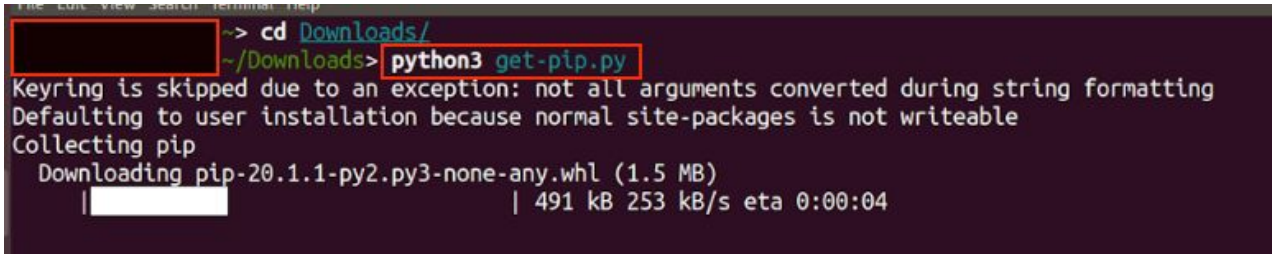
CONTEXT

- **Talk about package managers for languages and operating systems**

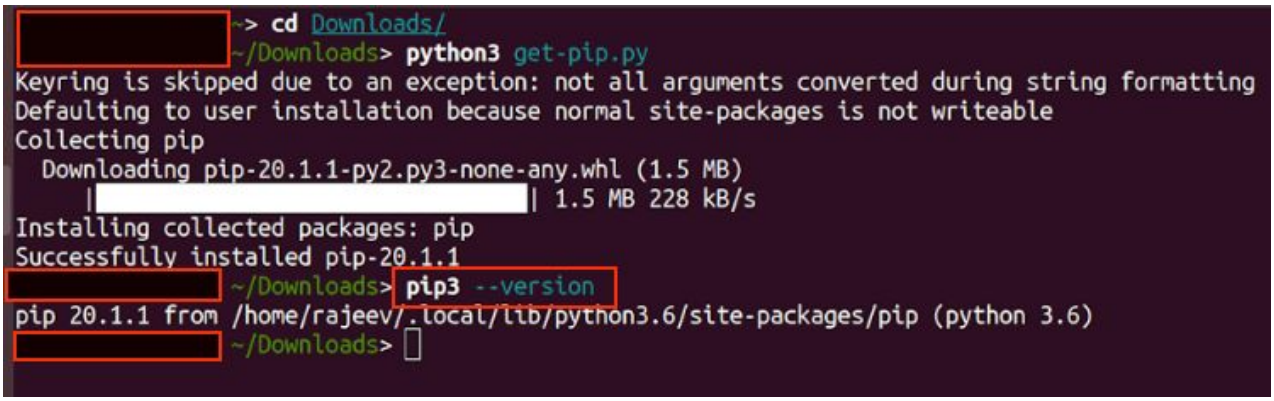
Class Steps	Teacher Action	Student Action
Step 1: **Warm Up** **(5 mins)**	Hello <student name> Today, we are going to do something very very interesting and I'm sure you will have a lot of fun! Before that, let's talk about what we learned in the last class.	ESR: We learned about packages/modules in python. We used os and shutil modules in python to create a backup for our files.
	Awesome! Python comes with certain packages/ modules pre-installed. os and shutil were such packages which comes pre-installed when you install python. There are many more interesting and exciting packages in python which we can install and use. To install packages in python we use a package manager. Do you remember using package managers before?	ESR: Yes, we have used package managers - npm, yarn - for installing react native libraries in our project earlier.
	Python uses a package manager called "pip" Pip stands for "Pip installs packages". We will be learning how to use pip to install python packages. We will also explore some interesting python packages!`	-
Teacher Initiates Screen Share		

CHALLENGE • **Install pip - python package manager** • **Use and explore howdoi package in python**		
Step 2: Teacher-led Activity (15 min)	Let's install pip package in our system.	-
	To install pip on windows use the following commands -open the link from Teacher Activity 1 - Save(Ctrl+s or Cmd + S) file to download get-pip.py to a folder on your computer. -Open a command prompt / terminal and navigate to the folder containing get-pip.py. -Run the following command: python3 get-pip.py <Teacher installs pip on their system and helps student install it on their system>	<Student installs pip on their system> Teacher guides the student to install pip on their system

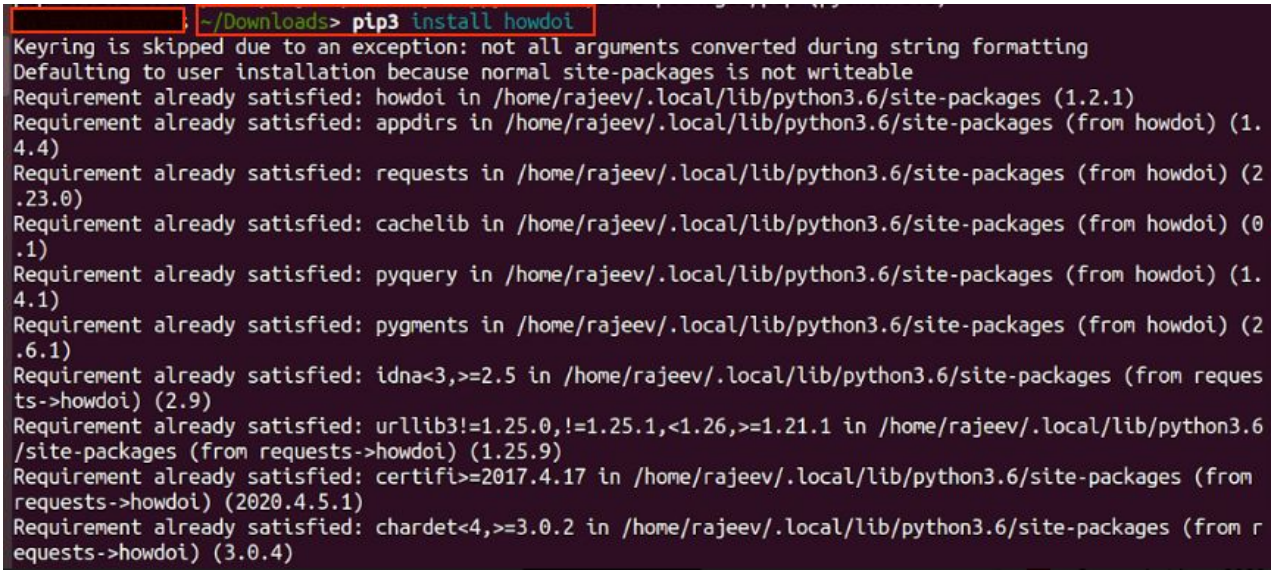




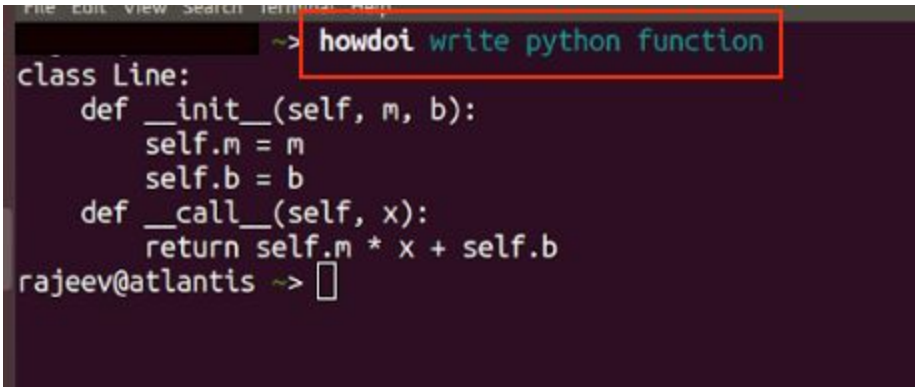
	To check if pip is correctly installed on your system. Run pip3 --version on your command prompt / terminal	Student checks installation for pip3 on their system

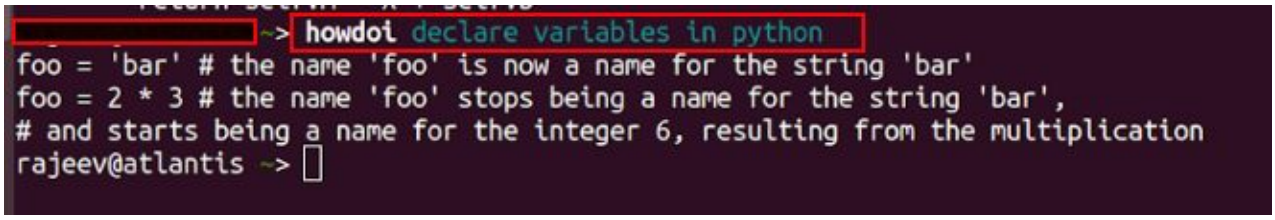


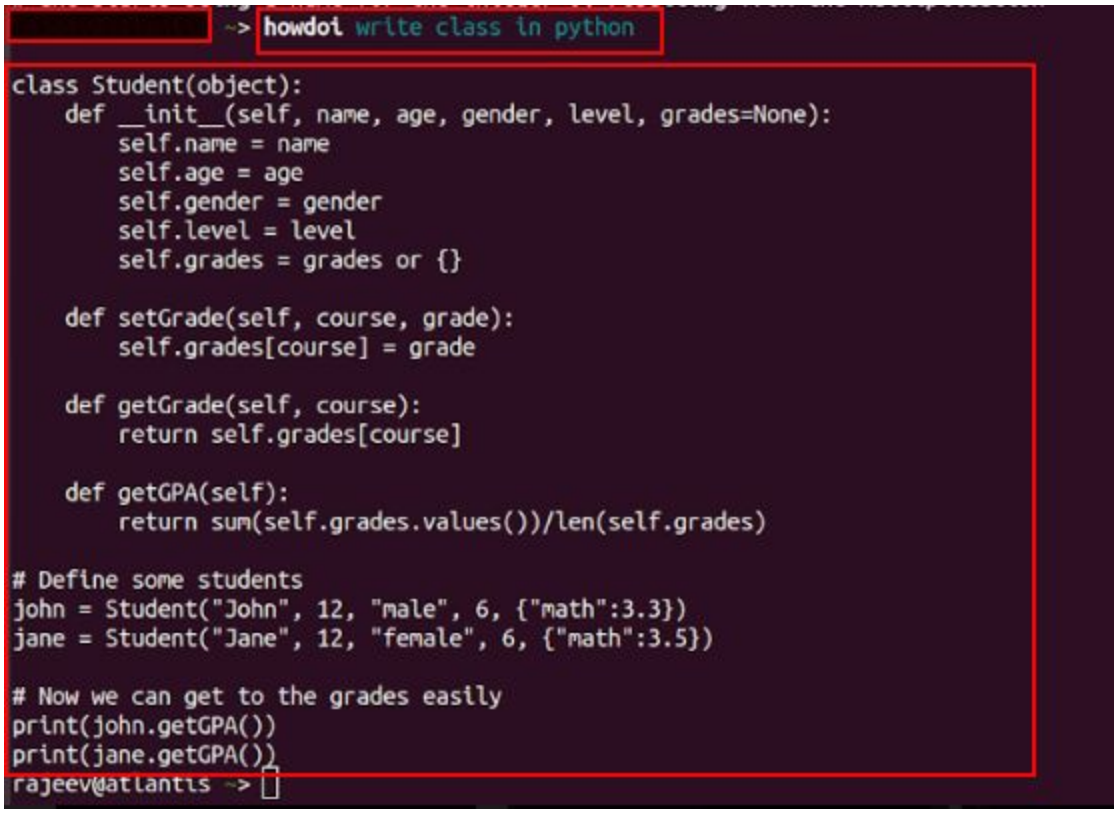
	Let's install an important and a very popular python package called howdoi. We need to simply run pip3 install howdoi The message displayed will tell us if howdoi was installed properly	Student installs howdoi on their system.



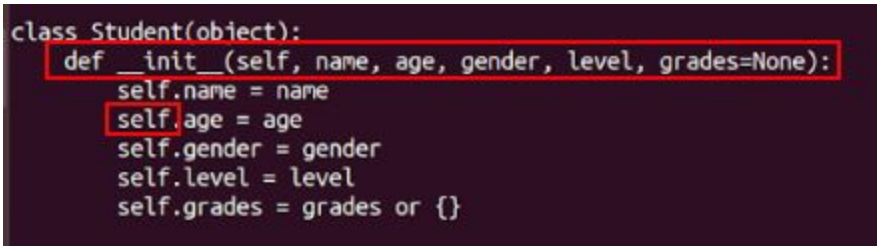
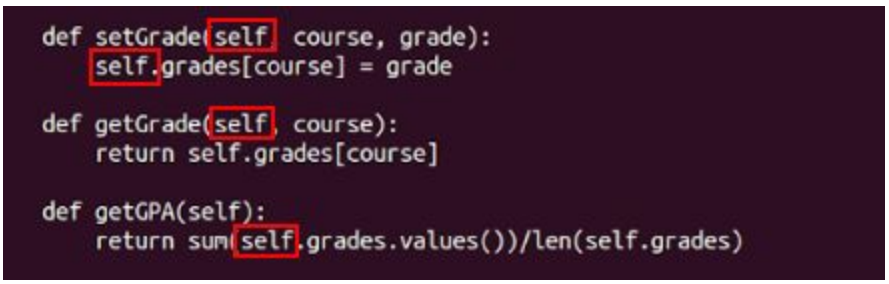
	howdoi is a very interesting tool for developers. howdoi is a type of google for developers BUT you get only one	Student asks questions on how to use howdoi and cases they will be helpful

	"best" result. The result is not always perfect. But it is very helpful and quick tool to learn to do anything related to programming.	
	Let's ask some python related questions to howdoi - like **howdoi write functions in python** Teacher asks the student to explain the output.	Student explains the response of howdoi to the teacher
		
	Let's ask a few more questions: **howdoi declare variables in python** Ask the student to explore more of howdoi tool and guide them towards exploring more of python using howdoi tool	Student experiments with using howdoi tool to learn more about python

		
	These were some of the topics that we have already explored in python. Now let's try to see if we can learn something more. Do you remember OOPs ?	Yes. Object Oriented Programming. It is a way of structuring code where programmers imagine everything as an object. We design objects using class (as a blueprint) and create new objects using the class.
	Great! Python is also an Object Oriented Language. You can similarly structure code using OOPs style of coding. But obviously python has a different syntax than javascript in which we have written our code in the past. Let's see if we can ask howdoi how to write class in python. Teacher runs: **howdoi write class in python** Allow the student to look at the code and explain the output	Student looks at the output and tries to understand how to create class in python



	A class is defined in python with the keyword: class Student: or class Student(object): Here Student is any class name you want to create. Indentation is very important while we are creating the class. __init__ is a pre-defined function in python and it is very similar to our constructor in javascript. It is called whenever we create an object using the class. It takes some arguments and creates an object using the arguments. You can see that __init__ function is taking several arguments. self -> similar to **this** keyword in javascript. Not necessary to pass name -> string age -> number gender -> string level -> number grades -> this is a dictionary in python. similar to json object in javascript. Do you notice the similarities of python language with javascript?	Student tries to decode how classes are created in python

		
	Similarly, there are other functions in the student class which are used to set and get grades GPA of the student. These are normal functions which will automatically get defined on the objects we create using the class. Notice the use of "self". "self" refers to the object created using the class.	Student tries to decode each function in the class. Student also tries to understand the use of "self" in the code
		
	How did we create a new object in javascript using a defined class?	ESR: We used new ClassName() We pass the arguments inside the brackets.

`` # Define some students john = Student("John", 12, "male", 6, {"math":3.3}) jane = Student("Jane", 12, "female", 6, {"math":3.5}) ```		
	Yes! Python doesn't need the keyword **new**. You can create new objects using the class by using class name. Teacher shows how class is created in the example.	Student learns how to create an object.
`` # Define some students john = Student("John", 12, "male", 6, {"math":3.3}) jane = Student("Jane", 12, "female", 6, {"math":3.5}) ```		
	This is how we create class and objects in python. Do you notice the similarities with Javascipt?	Student talks about the similarities with javascript. Student also asks questions about class and objects in javascript.
	Alright. Do you think you can create your own class and object in python?	ESR: I can try
	Ok... 1. Pick up any object... 2. Create a template Class for it... 3. Assign properties for the class in the init function 4. Write functions to define what the object can do 5. Create a new object using the class and pass properties to it.	-
Teacher Stops Screen Share		
	Now it's your turn. Please share your	

<table>
<tr><td></td><td>screen with me.</td><td></td></tr>
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- **Ask Student to press ESC key to come back to panel**
- **Guide Student to start Screen Share**
- **Teacher gets into Fullscreen**

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ACTIVITY

- **Ask questions to howdoi package to learn more about functions, classes, different data types etc.**
- **Student writes code to create a class and create objects using the class in python.**

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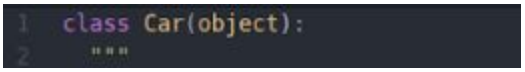
<tr><td>Step 3:
Student-Led Activity
(15 min)</td><td>Guide the student to pick up any object for which they want to create a class.

It can be a Bank Account, It can be a person, a car etc.</td><td>Student picks up any object for which they want to create a class</td></tr>
<tr><td></td><td>Guide the student to create a class.</td><td>syntax:-
class name_of_class:

<Student writes code to create a class>
class Car:</td></tr>
<tr><td colspan="3"> 
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<tr><td></td><td>What are the attributes which cars have?</td><td>ESR:-
A car has attributes like "color", "company", "speed_limit".
And methods like "change_gear", "start", "accelarate", "move" etc.</td></tr>
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	Now using constructor let's create object. Class functions that begins with double underscore (__) are called special functions as they have special meaning. One od these functions is the __init__() function. This special function gets called whenever a new object of that class is instantiated. This type of function is also called constructors in Object Oriented Programming (OOP). We normally use it to initialize all the variables. If you notice we have used a self word here. Do you know any word which is used for similar purpose? self works same like this in js. self represents the instance of the class. By using the "self" keyword we can access the attributes and methods of the class in python.	Student writes code code:- def __init__(self, model, color, company, speed_limit): self.color = color self.company = company self.speed_limit = speed_limit self.model = model

```
def __init__(self, model, color, company, speed_limit):
    self.color = color
    self.company = company
    self.speed_limit = speed_limit
    self.model = model
```

	Now lets add some methods to our car. Method of an object are corresponding functions of that class. Guide the student to think about the different methods in the class.	Student writes code : code:- def __init__(self, model, color, company, speed_limit): self.color = color self.company = company self.speed_limit = speed_limit self.model = model def start(self): print("started") def stop(self): print("stopped") def accelarate(self): print("accelarating...") "accelarator functionality here" def change_gear(self, gear_type): print("gear changed") " gear related functionality here"

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def __init__(self, model, color, company, speed_limit):
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def change_gear(self, gear_type):
  print("gear changed")
  " gear related functionality here"
```

</td></tr>
<tr><td></td><td>Now we have our class ready .
so let's create a new object called audi with it's attributes

we can access the elements by audi.color

We can print them up if we want</td><td>code:-
audi = car("A6", "red", "audi", 80)

Student prints the properties of the object</td></tr>
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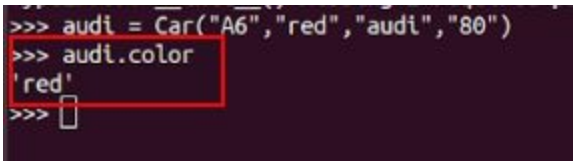		
	We can also call other functions we defined on these objects.	Student calls other functions on the audi object
	Awesome...this is how we create classes and objects in python.	-
Teacher Guides Student to Stop Screen Share		
FEEDBACK ● **Appreciate the student for their class** ● **Get them to play around with different ideas, automations which they can build for their system using python**		
Step 4: Wrap-Up (5 min)	We have learned creating classes and objects using python today. We will be learning how to use them to create backup for our files on a remote cloud.	-

	Meanwhile, why don't you explore howdoi tool and see if you can learn how to do a remote backup using howdoi tool?	Student thinks about exploring howdoi tool to create backup on remote server.
Teacher Clicks 		
Additional Activities	Encourage the student to write reflection notes in their reflection journal using markdown. Use these as guiding questions: ● What happened today? - Describe what happened - Code I wrote ● How did I feel after the class? ● What have I learned about programming and developing games? ● What aspects of the class helped me? What did I find difficult?	The student uses the markdown editor to write her/his reflection in a reflection journal.

Activity	Activity Name	Links
Teacher Activity 1	installing pip on windows	https://bootstrap.pypa.io/get-pip.py
Teacher Activity 2	Solution	https://github.com/whitehatjr/Python_class

Student Activity 1	installing pip on windows	https://bootstrap.pypa.io/get-pip.py