**Python by default don’t support abstract class and abstract method**, but we have a module which is ***abc module*** which we can use to achieve abstract classes.



What is abstract class? – let’s check this out. Computer class and process method and that’s how we create a method. How do we create a method – it will have a name(process here) and it will have parameters/arguments which accepts. And then it also has a body which is the print statement in our below case. In the body we can write our logic or processing etc.. we can take values, variables and do some operations. This is a normal method inside normal class.

Graphical user interface, text, application

Description automatically generated

What if we don’t want to method anything inside the method, which means we want to keep it blank, we just want to declare it which means it doesn’t a body so we mention ***pass*** as shown below. So in our above example we have ***definition,*** shown below is a declaration which is called as ***abstract method.***

Text, application

Description automatically generated

If a class has abstract method(s) it is called ***abstract class.***

By running the below code we will not get any output as we had mentioned pass in the method. We are able to create an object because this is not an abstract class yet.

Graphical user interface, application, table

Description automatically generated

How do we make it abstract class- as discussed we will import the module **abc** as shown below. Running the below code will give the error as we can’t create a object from the abstract because we have a abstract method.

Graphical user interface, text, application

Description automatically generated

Now let’s create another method laptop as shown below and run the code. This will result in error as it is inheriting computer which is an abstract method. So it is mandatory for us to **define** the method .

Graphical user interface, text, application, email

Description automatically generated

Let’s define the method as shown below and run the code and it should run.

Graphical user interface, text, application, chat or text message

Description automatically generated

***Abstract class will have at least one abstract method***

Why do we need abstract class?

1. Prevent a user from creating an object of that class – think of it as a template, it’s an idea NOT real. **It’s like a GHOST class**
2. Compels/forces a user to override abstract methods in a child class.

Let’s see how it works by creating 3 classes : vehicle is parent class and car, motorcycle are child classes. In our parent class we just ***defined*** it NOT implementing anything in the ***go method*** hence we gave ***pass.***

Now in the child classes we are overriding the go method as shown below

Text

Description automatically generated

Let’s create 3 objects from these 3 classes and run the below given code, without an error it will run.

Notice that since vehicle class doesn’t have a method it won’t print anything, whereas the others will print as per their print statements.

Text

Description automatically generated with medium confidence

* Now let’s consider we are creating a new **need for speed game** and we would like a user to create a object from a specific kind of vehicle. Whether it is a car from car class/motorcycle from motorcycle class.
* Now we want to **prevent** this user from creating the object from the **vehicle class** as it is too generic(means we do not have all the implementations setup for a vehicle) think of it like a GHOST car which doesn’t exist and we don’t want someone to create it as it is missing lot of features.
* We should allow the user to create objects from the child classes motorcycle/car which are having enough features.
* Now the question is how to **prevent a user from creating an object from the vehicle class**?
* This is the reason why we create **ABSTRACT CLASS**

As we know by default we cannot create abstract classes in python we need to import the module abc

A picture containing graphical user interface

Description automatically generated

* Now if we create a object from the vehicle class it will give the below error

Graphical user interface, text

Description automatically generated

* One more thing to add, if we don’t pay attention to motorcycle class and didn’t write the go method in it. When we run the code, python will prevent us from the creation of object. Check the error message below. This way we can ensure that child classes are not missing any implementation of methods that they inherit.
* Parent class says to its children “If you want to inherit from me, you need to override this abstract method of mine, if you don’t do it then you can’t be instantiated”.

Graphical user interface

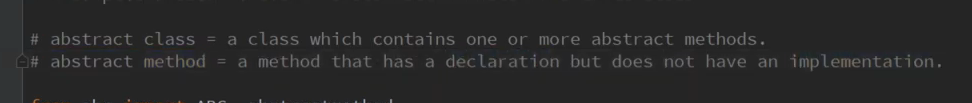
Description automatically generated with medium confidence

* Add another abstract method and observe the error on **car class**

Graphical user interface, text, application

Description automatically generated

Conclusion:



<https://www.pygame.org/docs/ref/locals.html>

<https://www.youtube.com/watch?v=JygYIDsgkn0&ab_channel=PythonBasics> – about the colors

[***https://www.youtube.com/watch?v=OhEfxv2zvfg&ab\_channel=JimSprouse***](https://www.youtube.com/watch?v=OhEfxv2zvfg&ab_channel=JimSprouse) ***–*** about the coordinates