

1. What is the concept of an abstract superclass?

An abstract superclass is a class in Python that serves as a blueprint for other classes but cannot be instantiated on its own. It defines a common structure and behavior that its subclasses must adhere to. Abstract classes often include abstract methods, which are methods without implementations in the abstract class itself. Subclasses are then required to provide implementations for these abstract methods, ensuring a consistent interface and behavior among related classes.

2. What happens when a class statement's top level contains a basic assignment statement?

When a class statement's top level contains a basic assignment statement, that statement is considered a class attribute assignment. It creates a class-level attribute that is shared by all instances of the class. This attribute is accessible through both the class itself and its instances. Any modifications to this attribute are reflected across all instances and the class.

3. Why does a class need to manually call a superclass's `__init__` method?

A class needs to manually call a superclass's `__init__` method when it wants to perform the initialization tasks defined in the superclass as well as any additional initialization specific to itself. This process is crucial for proper inheritance and ensures that the superclass's attributes and behavior are properly inherited and initialized in the subclass.

By calling the superclass's `__init__` method explicitly within the subclass's `__init__` method, you ensure that the necessary setup steps defined in the superclass are executed before performing any subclass-specific initialization. This helps maintain the integrity of the inheritance chain and avoids potential issues that might arise from incomplete initialization.

4. How can you augment, instead of completely replacing, an inherited method?

To augment (modify or extend) an inherited method without completely replacing it, you can follow these steps:

1. In the subclass, define a new method with the same name as the method you want to augment.
2. Inside the new method, use the `super()` function to call the inherited method from the superclass.
3. Add the additional behavior or modifications specific to the subclass.

```
class Parent:
    def method(self):
        print("Parent's method")

class Child(Parent):
    def method(self):
        super().method()
        print("Child's method")
```

5. How is the local scope of a class different from that of a function?

The local scope of a function pertains to variables and objects within the function, while the local scope of a class pertains to methods and attributes within the class.