Assignment 3

# Q1

An abstract superclass is a class that cannot be instantiated. It is used to define a common interface for other classes.

Abstract superclasses are useful for enforcing certain behaviour in subclasses. For example, an abstract superclass might define a method that all subclasses must implement.

# Q2

When a class statement's top level contains a basic assignment statement, it creates a class attribute. The assigned value becomes a shared attribute among all instances of the class. This means that any modifications to the attribute will be reflected in all instances of the class. Class attributes are accessed using the class name itself or through instances of the class.

# Q3

A class needs to manually call a superclass's \_\_init\_\_ method in order to initialise the inherited attributes and behaviours defined in the superclass. By calling the superclass's \_\_init\_\_ method, the subclass can ensure that the necessary initialization steps defined in the superclass are executed. This allows the subclass to inherit and utilise the initialization logic of the superclass, while also adding its own specific initialization steps if needed.

# Q4

To augment an inherited method instead of completely replacing it, the subclass can override the method by defining a new implementation that includes a call to the superclass's method using the super() function. This allows the subclass to extend or modify the behaviour of the inherited method while still utilising the functionality provided by the superclass. By calling super().method\_name(), the subclass invokes the superclass's method and then adds its own additional code before or after the superclass's method call.

# Q5

The local scope of a class is the area of the program where variables and methods defined in the class are accessible. The local scope of a function is the area of the program where variables and methods defined in the function are accessible.

The local scope of a class is defined by the class's body. The local scope of a function is defined by the function's body.

Variables and methods defined in the local scope of a class are not accessible from outside the class. Variables and methods defined in the local scope of a function are not accessible from outside the function.