Assignment

1. Define a base class called `Shape` with attributes `color` and `area`. Create a derived class `Circle` that inherits from `Shape` and has an additional attribute `radius`. Implement a method in the `Circle` class to calculate the area of the circle.

2. Create a class hierarchy with three classes: `Person`, `Employee`, and `Manager`. The `Person` class should contain attributes `name` and `age`. The `Employee` class should inherit from `Person` and include additional attributes `employee_id` and `salary`. The `Manager` class should inherit from `Employee` and have an extra attribute called `team_size`. Implement a method in the `Manager` class named `display_info` to print details such as name, age, employee ID, salary, and team size.

3. Define a class `Vehicle` with a method `display_info` that prints "This is a vehicle." Create a subclass called `Car` that inherits from `Vehicle` and overrides the `display_info` method to print "This is a car." Instantiate an object of the `Car` class and call the `display_info` method to observe method overriding in action.

4. Design an abstract base class `Animal` with an abstract method `make_sound()`. Create two subclasses, `Dog` and `Cat`, that inherit from the `Animal` class. Implement the `make_sound` method in both subclasses to print a characteristic sound for each animal. Instantiate objects of both `Dog` and `Cat` classes and call the `make_sound` method on each to verify the implementation.