Homework Assignment for Lesson 2: Inheritance and Polymorphism

Problem 1: Inheritance and Subclass Implementation

1.1. Define a class `Animal` with the following attributes:
- `name` (string)
- `sound` (string)

1.2. Include a method `make_sound` that prints the sound the animal makes.

1.3. Create two subclasses, `Dog` and `Cat`, that inherit from the `Animal` class. Add a specific sound for each subclass.

1.4. Instantiate an object of each subclass and call the `make_sound` method for each.

Problem 2: Polymorphism and Common Interface

2.1. Extend the `Animal` class to include a method `move` that prints a generic movement message.

2.2. Create a function `perform_action` that takes an object of type `Animal` and calls both the `make_sound` and `move` methods.

2.3. Instantiate objects of both the `Dog` and `Cat` subclasses and pass them to the `perform_action` function.

Problem 3: Real-world Application of Inheritance

3.1. Think of a real-world scenario where the concept of inheritance could be applied. Describe the scenario, including the superclass and subclasses, and define attributes and methods.

3.2. Write Python code to implement the classes based on your scenario. Instantiate objects of both the superclass and subclasses to demonstrate the inheritance hierarchy.

Submission Instructions:

- Save your Python script or Jupyter Notebook with the completed code.
- Include comments in your code to explain your implementation.
- Provide a brief written explanation for each problem, describing your thought process and any challenges faced.

Deadline:

Submit your completed assignment by [Specify Deadline].

Note: This assignment aims to reinforce your understanding of inheritance and polymorphism. Ensure that your code is well-structured and follows best practices. If you have any questions or encounter difficulties, don't hesitate to seek clarification during the next class.