

Week6Report

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3 Code Comprehension Problem (Estimated Time: 40 minutes):

Predict: What do you think the output of the program in Listings 1-4 will be?
There will be a compile error in the fourth listing.

Animal makes a sound, Dog barks, Cat Meows, and the fourth gives an illegal access error.

Run: Execute the program and observe the output. Did it match your expectations?

IllegalAccessError: cannot access class Dog from TestPolymorphism. Yes

Investigate: Describe how the sound method in the subclasses overrides the sound method in the parent class. Explain

By calling the subclass, it pulls the sound method from the subclass rather than the superclass

The use of the Animal reference to call the overridden method.

Modify: Add another animal, for example, a Bird, and make it produce its sound when the sound method is called.

Make: Describe the concepts of inheritance and polymorphism as demonstrated in the code snippet.

We have to make sure everything is given proper clarification when defining classes and methods.

4 Code-from-Scratch Problem (Estimated Time: 40 minutes)

Predict: Before writing the code, plan the classes and methods you will need.

A Book class that's the parent class to a RegularBook, EBook, and AudioBook class.

Run: Write and test the code. Did it work as expected?

yes.

Investigate: Explain the relationship between the parent class Book and its child classes. Describe the role of the read method in each class.

Read is shared between all of the child classes. Book describes a larger set that all of the smaller instances can be a part of.

Modify: Add methods specific to each book type. For example, a method to adjust brightness for EBook or adjust speed for AudioBook.

done.

Make: Use inheritance and polymorphism to create a different type of eBook, such as PDF, EPUB, or text.

done.

5 Debugging and Extending Problem (Estimated Time: 40 minutes)

Predict: Identify the errors in the code

The honk method does not exist in the Vehicle Class.

Run: Execute the code and confirm the errors you predicted.

Compilation failed, cannot find symbol, symbol honk(). Couldn't find honk in Vehicle. No main method in vehicle or Car class.

Investigate: Describe the reason for the error in the code.

The Road Class makes an object for Vehicles instead of the Car class, and Vehicles doesn't have a honk() method. No main method in vehicle or Car class.

Modify: Fix the error in the code and test it.

Added public to everything then gave the vehicle a honk method.

Make: Extend the code to add another class Bicycle that inherits from Vehicle. Implement its own start method and add a method to ring a bell.

6 Reflection Questions

1. How does inheritance promote code reusability?

Inheritance allows child classes to reuse code from parent classes, meaning that the code does not need to be rewritten for each permutation that uses it.

2. What is the significance of the `super` keyword in the context of inheritance in Java?

The `super` keyword refers to the parent class that a child class inherits from.

3. How does polymorphism allow objects of different classes to be treated as objects of a common super class?

4. What is the difference between method overloading and method overriding in Java?

Method overloading allows for multiple methods with the same name that take different arguments, whereas overriding allows one method to replace another in a certain context.

5. Why is it not possible to call a subclass-specific method using a superclass reference, even if it points to an instance of the subclass?

Because the super class reference refers to the encapsulating class instead of the parent class.