Practice
Implement Inheritance

Exercise

- Practice 1: The Hammond Bookstore

- Practice 2: World of Vehicles – Engines

Practice 1: The Hammond Bookstore

The Hammond Bookstore sells a variety of books that cater to a large audience. The details of the books need to be stored in an automated system that will help the store manager organize the stock efficiently.

Write a Java class that will capture the attributes and the behavior of the book.
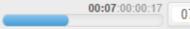
Tasks

- Create the `Book` class inside the package and define attributes like ISBN number, bookTitle, bookDescription, price.

- Identify the relationship between the book and author.

- Create the `Author` class and define attributes like author name, author pen name.

- Give an implementation for the `toString` method in the `Author` class.

- The `Book` can contain the author details, so define the attribute for author.

- Define a method in the `Book` class to display the details of the book.

Tasks (cont'd)

- Create the implementation class `BookImpl` inside the package

- Declare and initialize objects of the `Book` class in the main method of the `BookImpl` class.

- Call the setter methods to set values to the instance variables.

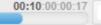- Call the `displayBookDetails()` method to display the book details

PRACTICE

Practice 2: World of Vehicles – Engines

Lukxtech, a leading vehicle manufacturer, has organized a competition to help select the design of its next-generation remote vehicle monitoring system. It manufactures a range of passenger cars based on different engine configurations.

To win the competition, participants must create a design that caters to all the different models of cars the company makes and create a proof of concept.

Tasks

- The heart of a vehicle is an engine and Lukxtech has a competitive family of engines. Since these engines power a range of vehicles and different customers prefer different kinds of engines, Lukxtech has developed engines that use a variety of propulsion technologies/fuels. The most prevalent engines are the internal combustion engines.

- The internal combustion engines vary based on the fuel they use:

  - Petrol engines

  - Diesel engines

  - Compressed Natural Gas (CNG) engines for the environmentally conscious customers

  - Electric engines, recently launched for the customers who believe in zero emissions

- The engines can have common attributes like Model No, displacement, max power, max rpm, # of cylinders.

- Electric engines will have specific attributes like voltage.

Tasks (cont'd)

Analyze the family of car engines produced by Lukxtech and create an appropriate hierarchy of classes that can be used to model the various engines. Name the parent class in the family as Engine.

- Determine the child classes in this family based on the description of the family of Lukxtech engines described above.

- Create appropriate constructors for each of the classes that you identify.

- Use the `super` keyword in the child class constructors.