Unit 2: Inheritance, Interface, and Package

1. Explain the concept of inheritance in Java. Write a program to demonstrate single inheritance using the extends keyword.
2. Write a program to create a class "Book" having data members author, title and publisher. Derive a class "BookInfo" having data members price, Stock_position and show() method. Initialise and display information of 3 books.
3. What is a subclass? Explain with a program where a subclass inherits properties from a superclass.
4. Describe the process of defining a subclass constructor. Write a program to show how the super keyword is used to call the parent class constructor.
5. Explain multilevel inheritance with a program (e.g., Animal → Mammal → Dog).
6. Why does Java not support multiple inheritance using classes? Write a program to show how multiple inheritance can be achieved using interfaces.
6. Define an interface in Java. Write a program to demonstrate interface implementation.
7. Write a program to show how multiple classes can implement the same interface.
8. Demonstrate with a program how multiple inheritance is achieved in Java using interfaces.
9. Explain the use of the final keyword in Java. Write a program to demonstrate:
    - final variable
    - final method
    - final class
10. What will happen if you try to override a final method? Write a program to explain.
11. What is the purpose of the finalize() method? Write a program that uses finalize() and explain how garbage collection calls it.
12. Write a program where objects become eligible for garbage collection and finalize() method executes.
13. Explain abstract classes and abstract methods. Write a program to show how an abstract class is extended by subclasses.
14. How are abstract classes different from interfaces? Illustrate with two example programs.
15. Write a Java program where an abstract class Shape has an abstract method area() and subclasses implement it (Circle, Rectangle).
16. Explain the four types of access specifiers in Java. Write a program to demonstrate private, default, protected, and public.
17. Write a program to show how protected members are accessible in subclasses but not in non-subclass classes of different packages.
18. Why are visibility controls important in Object-Oriented Programming? Illustrate with a program where improper access leads to errors.
19. Define a package in Java. Write a program to create and use a user-defined package.
20. Write the steps and a program to demonstrate how to import a package and access its classes.
21. Write a program to demonstrate the use of import and static import.
22. Explain package naming conventions with an example program.
23. Write a program to add a new class into an existing package and access it in another program.