**Exercise 6: Implementing the Proxy Pattern**

public class Main {

    public static void main(String[] args) {

        System.out.println("Creating ProxyImage object...");

        Image image = new ProxyImage("photo1.jpg");

        System.out.println("\nFirst call to display():");

        image.display(); // Loads from remote and displays

        System.out.println("\nSecond call to display():");

        image.display(); // Uses cached RealImage

    }

}

interface Image {

    void display();

}

class RealImage implements Image {

    private String fileName;

    public RealImage(String fileName) {

        this.fileName = fileName;

        loadFromRemoteServer(); // Simulate remote loading

    }

    private void loadFromRemoteServer() {

        System.out.println("Loading image from remote server: " + fileName);

    }

    @Override

    public void display() {

        System.out.println("Displaying image: " + fileName);

    }

}

class ProxyImage implements Image {

    private RealImage realImage;

    private String fileName;

    public ProxyImage(String fileName) {

        this.fileName = fileName;

    }

    @Override

    public void display() {

        if (realImage == null) {

            realImage = new RealImage(fileName); // Lazy initialization

        } else {

            System.out.println("Using cached image for: " + fileName);

        }

        realImage.display();

    }

}

Output:

