**Exercise 6: Implementing the Proxy Pattern**

**Image.java**

package com.mycompany.proxypattern;

public interface Image {

    void display();

}

**ProxyImage.java**

package com.mycompany.proxypattern;

public class ProxyImage implements Image {

    private String filename;

    private RealImage realImage;

    public ProxyImage(String filename) {

        this.filename = filename;

    }

    @Override

    public void display() {

        if (realImage == null) {

            realImage = new RealImage(filename);

        } else {

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

        }

        realImage.display();

    }

}

**RealImage.java**

package com.mycompany.proxypattern;

public class RealImage implements Image {

    private String filename;

    public RealImage(String filename) {

        this.filename = filename;

        loadFromRemoteServer();

    }

    private void loadFromRemoteServer() {

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

        try {

            Thread.sleep(2000);

        } catch (InterruptedException e) {

            e.printStackTrace();

        }

    }

    @Override

    public void display() {

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

    }

}

**ProxyPattern.java**

package com.mycompany.proxypattern;

public class ProxyPattern {

    public static void main(String[] args) {

        Image img1 = new ProxyImage("nature.jpg");

        Image img2 = new ProxyImage("cityscape.png");

        img1.display();

        System.out.println();

        img1.display();

        System.out.println();

        img2.display();

        System.out.println();

        img2.display();

    }

}

**Output**

