**Exercise 6: Implementing the Proxy Pattern**

CODE:

import javax.swing.\*;

import java.awt.\*;

import java.io.File;

import java.net.URL;

public class ProxyPatternExample {

interface Image {

void display();

}

static class RealImage implements Image {

private String path;

private ImageIcon imageIcon;

public RealImage(String path) {

this.path = path;

loadImage();

}

private void loadImage() {

try {

if (path.startsWith("http")) {

imageIcon = new ImageIcon(new URL(path));

System.*out*.println("Loading image from remote URL: " + path);

} else {

File file = new File(path);

if (!file.exists()) throw new RuntimeException("File not found: " + path);

imageIcon = new ImageIcon(path);

System.*out*.println("Loading image from local file: " + path);

}

} catch (Exception e) {

System.*out*.println("Error loading image: " + e.getMessage());

}

}

@Override

public void display() {

if (imageIcon != null) {

JFrame frame = new JFrame("Image Viewer");

JLabel label = new JLabel(imageIcon);

frame.add(label);

frame.pack();

frame.setDefaultCloseOperation(JFrame.*DISPOSE\_ON\_CLOSE*);

frame.setVisible(true);

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

} else {

System.*out*.println("Image not loaded properly.");

}

}

}

static class ProxyImage implements Image {

private String path;

private RealImage realImage;

public ProxyImage(String path) {

this.path = path;

}

@Override

public void display() {

if (realImage == null) {

realImage = new RealImage(path);

} else {

System.*out*.println("Image loaded from cache: " + path);

}

realImage.display();

}

}

public static void main(String[] args) {

Image image1 = new ProxyImage("sample.png");

Image image2 = new ProxyImage("https://via.placeholder.com/300");

image1.display();

image2.display();

image1.display();

image2.display();

}

}

OUTPUT:



