**Exercise 4: Implementing the Adapter Pattern**

**Step 1: Create a New Java Project**

Create a new Java project named AdapterPatternExample using your preferred IDE.

**Step 2: Define Target Interface**

Create an interface PaymentProcessor with methods like processPayment().

// PaymentProcessor.java

public interface PaymentProcessor {

void processPayment(double amount);}

**Step 3: Implement Adaptee Classes**

Create classes for different payment gateways with their own methods.

// PayPalGateway.java

public class PayPalGateway {

public void makePayment(double amount) {

System.out.println("Processing payment of $" + amount + " through PayPal.");}}

// StripeGateway.java

public class StripeGateway {

public void sendPayment(double amount) {

System.out.println("Processing payment of $" + amount + " through Stripe.");}}

// SquareGateway.java

public class SquareGateway {

public void executePayment(double amount) {

System.out.println("Processing payment of $" + amount + " through Square.");

}}

**Step 4: Implement the Adapter Class**

Create an adapter class for each payment gateway that implements PaymentProcessor and translates the calls to the gateway-specific methods

// PayPalAdapter.java

public class PayPalAdapter implements PaymentProcessor {

private PayPalGateway payPalGateway;

public PayPalAdapter(PayPalGateway payPalGateway) {

this.payPalGateway = payPalGateway;}

@Override

public void processPayment(double amount) {

payPalGateway.makePayment(amount);}}

// StripeAdapter.java

public class StripeAdapter implements PaymentProcessor {

private StripeGateway stripeGateway;

public StripeAdapter(StripeGateway stripeGateway) {

this.stripeGateway = stripeGateway;}

@Override

public void processPayment(double amount) {

stripeGateway.sendPayment(amount);}}

// SquareAdapter.java

public class SquareAdapter implements PaymentProcessor {

private SquareGateway squareGateway;

public SquareAdapter(SquareGateway squareGateway) {

this.squareGateway = squareGateway;}

@Override

public void processPayment(double amount) {

squareGateway.executePayment(amount);}}

**Step 5: Test the Adapter Implementation**

Create a test class to demonstrate the use of different payment gateways through the adapter

// AdapterPatternExample.java

public class AdapterPatternExample {

public static void main(String[] args) {

PaymentProcessor payPalProcessor = new PayPalAdapter(new PayPalGateway());

payPalProcessor.processPayment(100.00);

PaymentProcessor stripeProcessor = new StripeAdapter(new StripeGateway());

stripeProcessor.processPayment(200.00);

PaymentProcessor squareProcessor = new SquareAdapter(new SquareGateway());

squareProcessor.processPayment(300.00);}}