**Exercise 4: Implementing the Adapter Pattern**

**Scenario:**

You are developing a payment processing system that needs to integrate with multiple third-party payment gateways with different interfaces. Use the Adapter Pattern to achieve this.

**Steps:**

1. **Create a New Java Project:**
   * Create a new Java project named **AdapterPatternExample**.
2. **Define Target Interface:**
   * Create an interface **PaymentProcessor** with methods like **processPayment()**.
3. **Implement Adaptee Classes:**
   * Create classes for different payment gateways with their own methods.
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.
5. **Test the Adapter Implementation:**
   * Create a test class to demonstrate the use of different payment gateways through the adapter.

Code –

package Design\_Patterns\_And\_Principles.AdapterPatternExample;

// Target Interface

interface PaymentProcessor {

    void processPayment(double amount);

}

// Adaptee Class for PayPal

class PayPal {

    void sendPayment(double amount) {

        System.out.println("Payment of $" + amount + " processed via PayPal.");

    }

}

// Adaptee Class for Stripe

class Stripe {

    void makePayment(double amount) {

        System.out.println("Payment of $" + amount + " processed via Stripe.");

    }

}

// Adapter Class for PayPal

class PayPalAdapter implements PaymentProcessor {

    private PayPal payPal;

    public PayPalAdapter(PayPal payPal) {

        this.payPal = payPal;

    }

    @Override

    public void processPayment(double amount) {

        payPal.sendPayment(amount);

    }

}

// Adapter Class for Stripe

class StripeAdapter implements PaymentProcessor {

    private Stripe stripe;

    public StripeAdapter(Stripe stripe) {

        this.stripe = stripe;

    }

    @Override

    public void processPayment(double amount) {

        stripe.makePayment(amount);

    }

}

// Test class to demonstrate the Adapter implementation

public class PaymentAdapterTest {

    public static void main(String[] args) {

        // Using PayPal via the adapter

        PayPal payPal = new PayPal();

        PaymentProcessor payPalAdapter = new PayPalAdapter(payPal);

        payPalAdapter.processPayment(100.0);

        // Using Stripe via the adapter

        Stripe stripe = new Stripe();

        PaymentProcessor stripeAdapter = new StripeAdapter(stripe);

        stripeAdapter.processPayment(150.0);

    }

}