**Exercise 8: Implementing the Strategy Pattern**

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

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

**Step 2: Define Strategy Interface**

Create an interface PaymentStrategy with a method pay().

// PaymentStrategy.java

public interface PaymentStrategy {

void pay(double amount);

}

**Step 3: Implement Concrete Strategies**

Create classes CreditCardPayment and PayPalPayment that implement PaymentStrategy.

// CreditCardPayment.java

public class CreditCardPayment implements PaymentStrategy {

private String cardNumber;

private String cardHolderName;

private String cvv;

private String expiryDate;

public CreditCardPayment(String cardNumber, String cardHolderName, String cvv, String expiryDate) {

this.cardNumber = cardNumber;

this.cardHolderName = cardHolderName;

this.cvv = cvv;

this.expiryDate = expiryDate;}

@Override

public void pay(double amount) {

System.out.println("Paid $" + amount + " using Credit Card.");}}

// PayPalPayment.java

public class PayPalPayment implements PaymentStrategy {

private String email;

private String password;

public PayPalPayment(String email, String password) {

this.email = email;

this.password = password; }

@Override

public void pay(double amount) {

System.out.println("Paid $" + amount + " using PayPal.");

}

}

**Step 4: Implement Context Class**

Create a class PaymentContext that holds a reference to PaymentStrategy and a method to execute the strategy.

// PaymentContext.java

public class PaymentContext {

private PaymentStrategy paymentStrategy;

public void setPaymentStrategy(PaymentStrategy paymentStrategy) {

this.paymentStrategy = paymentStrategy;

}

public void pay(double amount) {

if (paymentStrategy != null) {

paymentStrategy.pay(amount);

} else {

System.out.println("Payment strategy not set.");

}

}

}

**Step 5: Test the Strategy Implementation**

Create a test class to demonstrate selecting and using different payment strategies.

// StrategyPatternExample.java

public class StrategyPatternExample {

public static void main(String[] args) {

PaymentContext context = new PaymentContext();

// Pay using Credit Card

PaymentStrategy creditCard = new CreditCardPayment("1234567890123456", "John Doe", "123", "12/24");

context.setPaymentStrategy(creditCard);

context.pay(100.00);

// Pay using PayPal

PaymentStrategy payPal = new PayPalPayment("johndoe@example.com", "password123");

context.setPaymentStrategy(payPal);

context.pay(200.00);

}

}