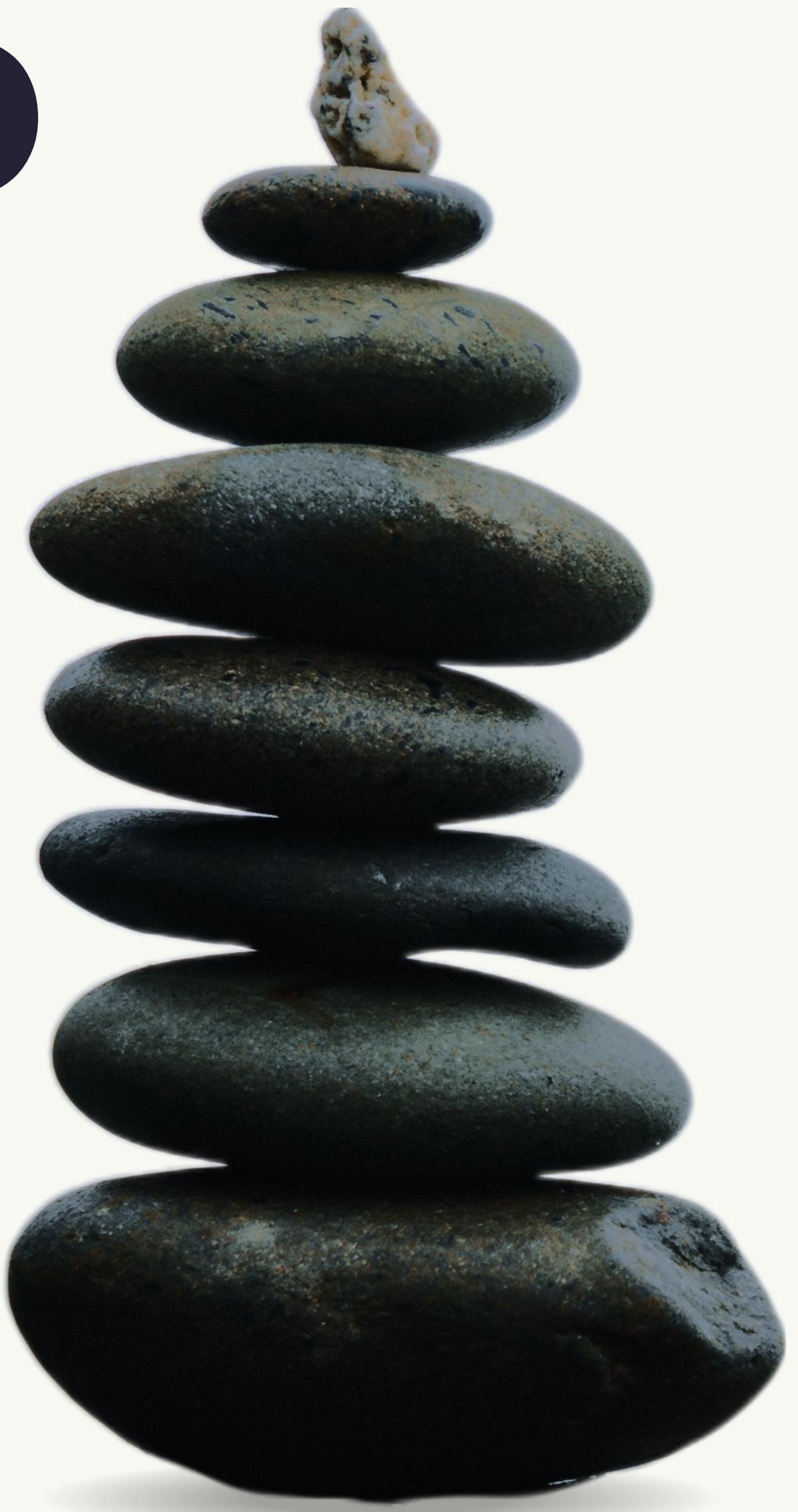


HOW TO BUILD YOUR CODE USING **SOLID** **PRINCIPLES**



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Brought to you by
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Single Responsibility Principle

Each class should have one responsibility

BAD ▶ Mixing responsibilities in a class

```
public class User {  
    void saveUser(User user) {  
        // Saving user data to the database  
    }  
    void processPayment(double amount) {  
        // Process payment logic  
    }  
}
```

GOOD ▶ Separating responsibilities

```
class UserService {  
    void saveUser(User user) {  
        // Saving user data to the database  
    }  
}  
  
class PaymentProcessor {  
    void processPayment(double amount) {  
        // Process payment logic  
    }  
}
```

Open/Closed Principle

Software entities should be open for extension but closed for modification

BAD ▶ Modifying existing class for new methods

```
class PaymentProcessor {  
    void processPayment(double amount, String method) {  
        if (method.equals("CreditCard")) {  
            // Credit card payment logic  
        } else if (method.equals("PayPal")) {  
            // PayPal payment logic  
        }  
        // More payment methods...  
    }  
}
```

GOOD ▶ Extending without modification

```
interface PaymentMethod {  
    void processPayment(double amount);  
}  
  
class CreditCardPayment implements PaymentMethod {  
    void processPayment(double amount) {  
        // Credit card payment logic  
    }  
}  
  
class PayPalPayment implements PaymentMethod {  
    void processPayment(double amount) {  
        // PayPal payment logic  
    }  
}
```

Liskov Substitution Principle

Subtypes must be substitutable for their base types

BAD ▶ Modifying existing class for new methods

```
class Rectangle {  
    int width;  
    int height;  
    void setWidth(int width) { /* ... */ }  
    void setHeight(int height) { /* ... */ }  
    int area() { /* ... */ }  
}  
  
class Square extends Rectangle { /* ... */ }
```

GOOD ▶ Extending without modification

```
abstract class Shape {  
    abstract int area();  
}  
  
class Rectangle extends Shape { /* ... */ }  
  
class Square extends Shape { /* ... */ }
```

Interface Segregation Principle

A class should not be forced to implement interfaces it doesn't use. keep interfaces focused on specific tasks.

BAD ► Expanded interface with unnecessary methods

```
interface Machine {  
    void print();  
    void scan();  
    void fax();  
}  
  
class AllInOnePrinter implements Machine { /* ... */ }
```

GOOD ► Separated interfaces for specific responsibilities

```
interface Printer {  
    void print();  
}  
  
interface Scanner {  
    void scan();  
}  
  
interface Faxer {  
    void fax();  
}  
  
class AllInOnePrinter implements Printer, Scanner { /* ... */ }
```

Dependency Inversion Principle

Decoupling high-level modules from low-level modules by introducing an abstraction layer

BAD ▶ Direct Dependency

```
class LightBulb {  
    void turnOn() {  
        // Code to turn on the light bulb  
    }  
  
}  
  
class Switch {  
    private LightBulb bulb = new LightBulb();  
  
    void press() {  
        bulb.turnOn();  
    }  
  
}
```

GOOD ▶ Both depend on abstractions

```
interface Switchable {  
    void turnOn();  
}  
  
class LightBulb implements Switchable {  
    void turnOn() { /** Code to turn on the light bulb */ }  
}  
  
class Switch {  
    private Switchable device;  
  
    Switch(Switchable device) {  
        this.device = device;  
    }  
}
```

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