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SOLID: Interface Segregation Principle

Get introduced to the Interface Segregation Principle.

We'll cover the following

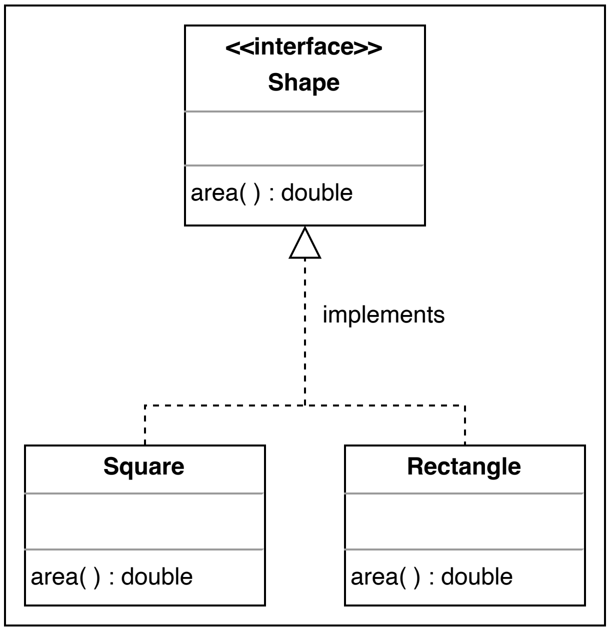
Introduction

The **Interface Segregation Principle (ISP)** is a design principle that does not recommend having methods that an interface would not use and require. Therefore, it goes against having fat interfaces in classes and prefers having small interfaces with a group of methods, each serving a particular purpose.

The goal behind implementing the ISP is to have a precise code design that follows the correct abstraction guidelines and tends Got any feedback? Get in touch with us. would help in making it more robust and reusable. This becomes key when more and more features are added to the software, making it bloated and harder to maintain.

Example

Let’s construct a simple interface called `Shape` that has the `area()` method, and `Square` and `Rectangle` as the classes to implement it as shown below:



The Shape interface

So far, this implementation seems right, as both the `Square` and `Rectangle` classes are implementing an interface that they’re using. Let’s see how this example can violate the ISP.

Violation

Let’s add the `volume()` method to the `Shape` interface and have a new subclass `Cube` to implement it:

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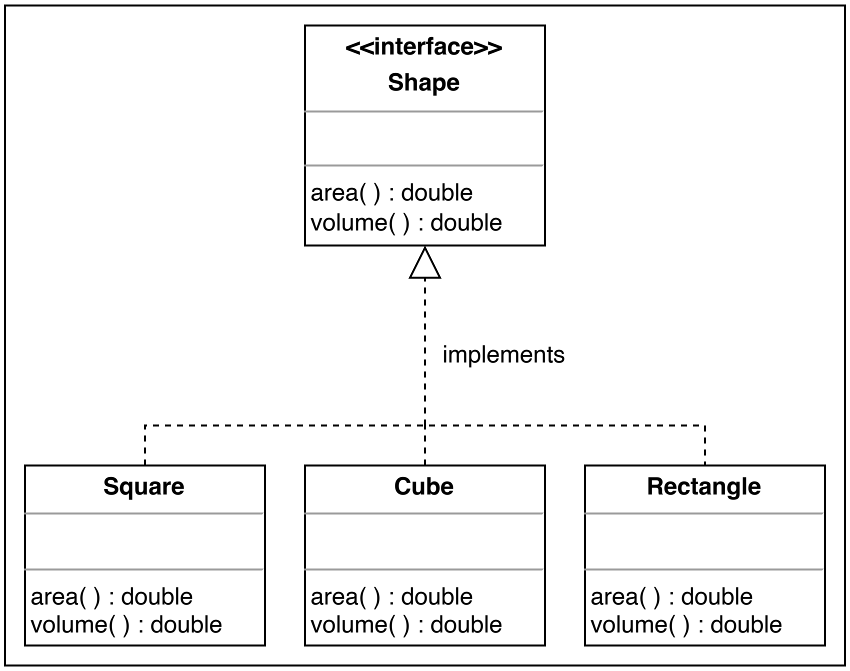

Violation of the ISP

The violation leads to a problem. The 2-D shapes cannot have a volume, yet they're forced to implement the `volume()` method of the `Shape` interface that they don't have any use of. This is a clear violation of the Interface Segregation Principle.

Solution

To adhere to the Interface Segregation Principle (ISP), it is essential to ensure that an interface is client-specific rather than general-purpose. In this context, the solution involves implementing the Shape interface into two distinct interfaces: `TwoDimensionalShape` for 2D shapes and `ThreeDimensionalShape` for 3D shapes.

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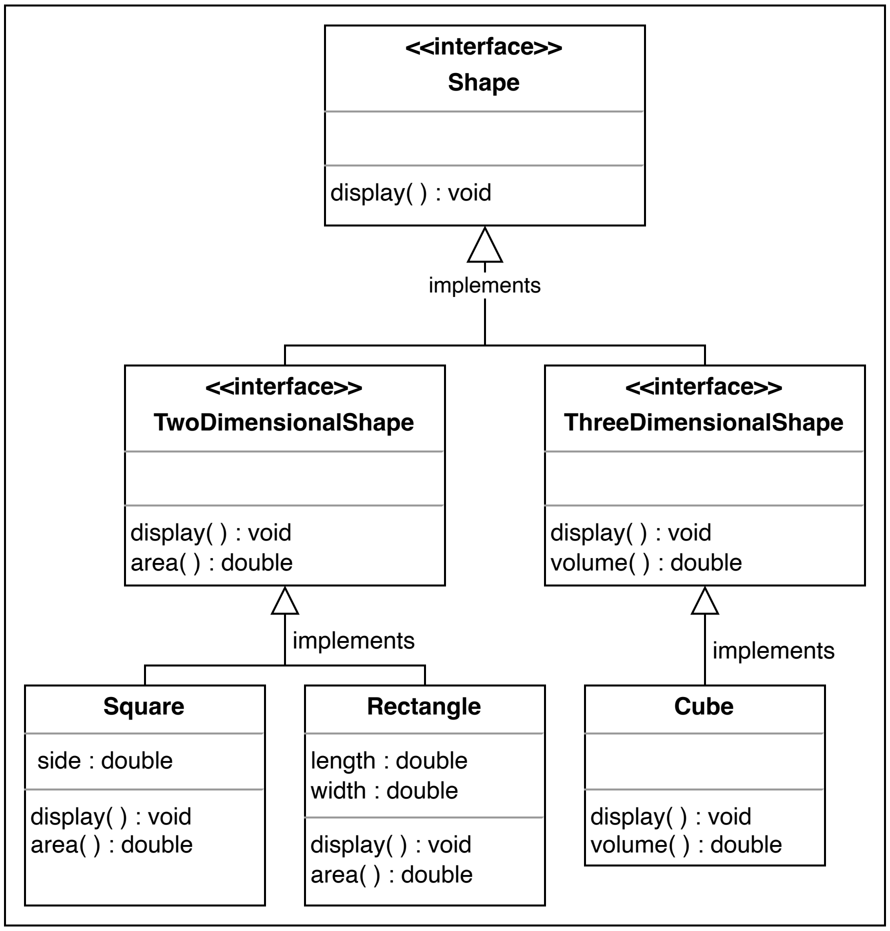

Solution of the ISP

By organizing interfaces based on the dimensions of shapes, we avoid forcing 2D shape implementations to provide methods irrelevant to them. The separation follows the Interface Segregation Principle, resulting in a cleaner and more intuitive design. Classes representing 2D shapes only need to implement `TwoDimensionalShape`, while 3D shapes like `Cube` implement `ThreeDimensionalShape`, requiring the implementation of the `volume()` method appropriate to their nature.

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Conclusion