

# **SEMINAR PAPER**

In Computer Science

## **Interface segregation principle**

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# 1 SOLID principles

These principles establish practices that lend to developing software with considerations for maintaining and extending as the project grows. Adopting these practices can also contribute to avoiding code smells, refactoring code, and Agile or Adaptive software development. [1]

## 1.1 S - Single Responsibility Principle

The single responsibility principle states that a class should have only a single reason to change throughout its lifetime. This principle ensures that a class exists only for a single reason but can have multiple methods to carry out distinct functions.

## 1.2 O - Open Close Principle

This principle states that objects should be open for extension but closed for modification. The open and close principle ensures our code is easily extensible without editing or rewriting the existing codebase. Designing software applications using this principle ensures extensibility and the reusability of objects.

## 1.3 L - Liskov Substitution Principle

This principle illustrates that if a section of your code is extending a superclass, then all subclasses of the superclass should be able to replace the superclass in your code. A section of your code does not have to know which class it is as far as it is a superclass subclass. The application of this principle ensures the easy integration of classes.

## 1.4 I - Interface Segregation Principle

The I in SOLID stands for interface segregation, and it simply means that larger interfaces should be split into smaller ones. By doing so, we can ensure that implementing classes only need to be concerned about the methods that are of interest to them.

## 1.5 D - Dependency Inversion Principle

The dependency inversion principle ensures that classes should not depend on solid classes but should only depend on abstraction. By following this approach, it makes the interchanging of modules and classes or services simple. The dependency inversion principle makes changing dependencies easier.

## 2 Interface segregation principle

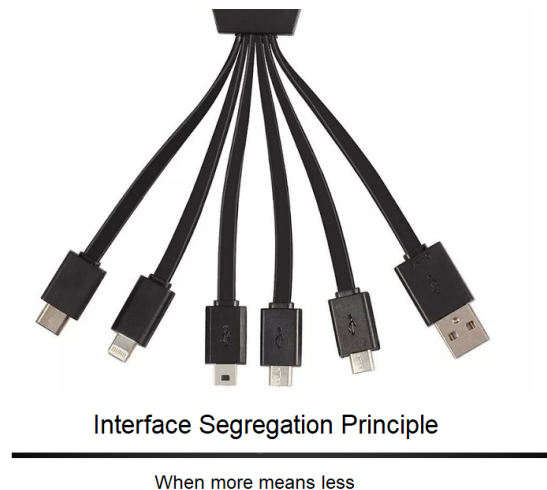


Figure 1: Interface segregation principle

“Clients should not be forced to depend upon interfaces that they do not use.”

## 3 Practical Example

In the first example the Ostrich class is forced to use the fly method. It is a clear violation of the Interface Segregation Principle. As you can see in the second example, the fly and walk methods were separated into an extra interface. With this implementation it is possible to use the fly and walk method at the Duck class and the walk method at the Ostrich class. Now no class is forced to implement an unused method.

```

interface Bird {
    fly(): void;
    walk(): void;
}
class Duck extends Bird{
    fly(){
        // Duck can fly
    }
    walk(){
        // Duck can walk
    }
}
class Ostrich extends Bird{
    fly(){
        // Ostrich cant fly... throw some error
    }
    walk(){
        // Ostrich can walk
    }
}

```

Listing 1: initial scenario

```
interface BirdFly{
    fly(): void;
}
interface BirdWalk{
    walk(): void;
}
class Duck extends BirdFly, BirdWalk{
    fly(){
        // Duck can fly
    }
    walk(){
        // Duck can walk
    }
}
class Ostrich extends BirdWalk{
    walk(){
        // Ostrich can walk
    }
}
```

Listing 2: ISP Implementation

# Bibliography

- [1] Digitalocean, "Solid: The first 5 principles of object oriented design," 2021. [Online]. Available: [https://www.digitalocean.com/community/conceptual\\_articles/s-o-l-i-d-the-first-five-principles-of-object-oriented-design](https://www.digitalocean.com/community/conceptual_articles/s-o-l-i-d-the-first-five-principles-of-object-oriented-design)

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