Interface Segregation Principle

Overview

- the Interface Segregation Principle was defined by Robert C. Martin while consulting for Xerox to help them build the software for their new printer systems
- "Clients should not be forced to depend upon interfaces that they do not use."
  - a client should not implement an interface if it does not use a method in that interface
  - happens mostly when one interface contains more than one functionality, and the client only needs one functionality and not the other
- the goal of the Interface Segregation Principle is to reduce the side effects and frequency of required changes by splitting the software into multiple, independent parts
- interface design is a tricky job because once you release your interface you can not change it without breaking all implementation
- using the interface keyword in Java means that you have to implement all of the methods in the interface before any class can use it
  - if you follow this principle in Java, you will implement less methods because each interface will have a single functionality

Overview

- suppose there is a system which has multiple functionalities and various clients using those functionalities
  - we could create an API and implement it by using the Java "interface" keyword
- If we created a single interface then all clients will have to unnecessarily implement all other clients' methods just to make their interface compile
  - this is referred to as a "fat" interface
    - an object-oriented designer's nightmare
    - makes the overall design rigid due to the enormous effort required to manage changes across all clients when making a change to a method pertaining to only one client
- the Interface Segregation Principle avoids the design drawbacks associated with a fat interface by refactoring each fat interface into multiple segregated interfaces
  - each segregated interface is a lean interface as it only contains methods which are required for a specific client
- a lean interface does not mean one method per interface
- a lean interface caters to a consumers of a specific type of functionality or a specific set of customers all of whom have the same functional needs