Item 18: Prefer interfaces to abstract classes

Existing classes can be easily redesigned to implement a new interface

Steps to add a new interface for several classes:

- add an “implements *interfaceName*” in each class
- add the required methods for each class

What about abstract classes?

Two classes should extend the same abstract class –>

Place the abstract class high up in the type hierarchy after an ancestor of both classes –>

Great damage to the type hierarchy.

Interfaces are ideal for defining mixins.

- Mixins provides some additional behavior
  (For example `Comparable`)
- Class can implement several mixins as interfaces
- Class can have only one superclass –
  there is no place in hierarchy for mixins as abstract classes

Interfaces allow the construction of nonhierarchical types

interface Singer

+ interface Songwriter

= interface SingerSongwriter extends Singer, Songwriter

The alternative is a bloated class hierarchy containing a separate class for every supported combination of attributes
(2*n* possible combinations).

Interfaces enable safe and powerful increasing of functionality

+ Using an interface – enable to use composition

- Using an abstract class – no alternative but to use inheritance

Abstract *skeletal implementation* class

- Combination:
  Skeletal implementation = Interface + Abstract class
- Skeletal implementations are called Abstract*Interface* (AbstractCollection, AbstractSet, AbstractList, AbstractMap)
- Simulated multiple inheritance
- Simple implementation

Advantage of abstract classes:
It is far easier to evolve an abstract class than an interface

+ All existing implementations of the abstract class will then provide the new method

- Once an interface is released and implemented,
it is almost impossible to change

Item 19: Use interfaces only to define types

- Don’t use constant interfaces, it’s antipattern.
- Use utility classes for constants and static import.
- Constant interfaces in the Java platform libraries, such as java.io.ObjectStreamConstants - should be regarded as anomalies