本书主旨就是帮助你更有效的使用java语言和他自己的基础库，这些基础库包括java.lang, java.util,和java.io,以及这些库的字库比如 java.util.concurrent and java.util.function。其他的一些库我们也会有所提及。

本书由90个条款组成，每个条款都阐述了一种规则。这些规则都应该在实践中得到，最优秀最有经验的程序员都认为这些规则是非常有用的。这些规则松散的被分成了11章，每章都涵盖软件设计的一个宽的范围。本书不推荐从头按顺阅读，因为每项或多或少都可以独立存在的。这些规则被高度穿插引用因此你可以很方便来规划自己正本书的阅读的进程。

自从本书发行的上一个版本之后，java平台增加了许多新的特性。本书的大部分规则将一些方式去运用这些特性。下面的表展示了这些关键特性的主要内容都分布在哪些规则中，以及支持这些特性的java平台。

大部分规则通过程序示例进行阐明。本书的一个关键特性就是代码示例包含有许多设计模式和惯用条款。在合适的地方，他们进行交叉引用，可以在标准的Gamma95中找到标准的引用。

Many items contain one or more program examples illustrating some practice to be avoided. Such examples, sometimes known as antipatterns, are clearly labeled with a comment such as // Never do this!. In each case, the item explains why the example is bad and suggests an alternative approach.

许多规则包含了一个或者多个程序代码，这些程序代码是应该避免出现的。例如有些例子，有时候作为反模式被熟知，这些例子的被清楚的以一个注释锁标明：永远不用这么做。每个例子，这些规则项解释为什么这个例子是错误的，并且给出一个代替的方式。

This book is not for beginners: it assumes that you are already comfortable

with Java. If you are not, consider one of the many fine introductory texts, such as Peter Sestoft’s Java Precisely [Sestoft16]. While Effective Java is designed to be accessible to anyone with a working knowledge of the language, it should provide

food for thought even for advanced programmers.

这本书不适合初学者：它会假设读者已经非常熟悉java。如果你不符合要求，参考许多优秀的引导性内容，比如peter的java精粹。而effectjava是提供给任何一个以java语言为工作内容的读者，他可以提供思考上的帮助，甚至是对于一些高级程序员。

Most of the rules in this book derive from a few fundamental principles.Clarity and simplicity are of paramount importance. The user of a component should never be surprised by its behavior. Components should be as small as possible but no smaller. (As used in this book, the term component refers to any reusable software element, from an individual method to a complex framework consisting of multiple packages.) Code should be reused rather than copied. The dependencies between components should be kept to a minimum. Errors should be detected as soon as possible after they are made, ideally at compile time.

本书的大部分规则都是衍生与一少部分基础原则.清晰简单是至关重要的。组件的使用者不应该被他行为感到惊奇，组件应该尽可能小但是不能太小。本书中使用的术语"组件"是指任可以重用的软件对象，从一个独立的方法到一个包括多个包的复杂的框架。代码应该被重用而不是复制。组件之间的依赖应该保持最小。错误在他们产生之后应该尽可能快的被检测出来,理想状态是在编译器就能被发现。

While the rules in this book do not apply 100 percent of the time, they do

characterize best programming practices in the great majority of cases. You

should not slavishly follow these rules, but violate them only occasionally and

with good reason. Learning the art of programming, like most other disciplines,

consists of first learning the rules and then learning when to break them.

本书中这些规则不适合所以的情况，然后，他们在大部分示例中表现为最好的编程实践。你不应该完成顺从这些规则，但是如果违背这些规则应该是很偶然并且需要合适的理由。学习编程的艺术（适用于大部分原则），包括第一次学习使用规则，然后学习打破规则。

For the most part, this book is not about performance. It is about writing

programs that are clear, correct, usable, robust, flexible, and maintainable. If you can do that, it’s usually a relatively simple matter to get the performance you need(Item 67). Some items do discuss performance concerns, and a few of these items provide performance numbers. These numbers, which are introduced with the

phrase “On my machine,” should be regarded as approximate at best.

本书大部分章节，不是关于性能的。本书是提供编写清晰，正确，可用，健壮，可扩展和可维护代码的指南。如果你能做到这些，那么提升你需要的性能通常就是一件很简单的事情了。有些条款讨论了性能的问题，但是很少的条款提供了性能指标。这些指标是使用在“On my machine”机器上，被考虑是接近最好的选择。

For what it’s worth, my machine is an aging homebuilt 3.5GHz quad-core

Intel Core i7-4770K with 16 gigabytes of DDR3-1866 CL9 RAM, running Azul’s

Zulu 9.0.0.15 release of OpenJDK, atop Microsoft Windows 7 Professional SP1

(64-bit).

下面是值得参考，我个人机器是一个自组装的老机器:3.5GH 四核 16G内存，openjdk，win7

When discussing features of the Java programming language and its libraries,

it is sometimes necessary to refer to specific releases. For convenience, this book

uses nicknames in preference to official release names. This table shows the mapping between release names and nicknames:

在讨论java程序设计语言的特性和他函数库的时候，是非常有必要明确一下发型版本。为了方便，本书使用别名而不是官方的版本名称。下面的表展示了发行版本及其对应的别名。

The examples are reasonably complete, but favor readability over completeness.

They freely use classes from packages java.util and java.io. In order to

compile examples, you may have to add one or more import declarations, or other

such boilerplate. The book’s website, http://joshbloch.com/effectivejava,

contains an expanded version of each example, which you can compile and run.

书中的例子是适度完整，可读性超过了完整性，他们自由使用来自util和io包中的类。为了去编译这些例子，需要自己添加一个或者多个import声明，或者其他引用。本书的官网包括了每个例子的扩展版本，这些版本的例子，可以直接编译和执行。

For the most part, this book uses technical terms as they are defined in The

Java Language Specification, Java SE 8 Edition [JLS]. A few terms deserve

special mention. The language supports four kinds of types: interfaces (including

annotations), classes (including enums), arrays, and primitives. The first three are known as reference types. Class instances and arrays are objects; primitive values are not. A class’s members consist of its fields, methods, member classes, and member interfaces. A method’s signature consists of its name and the types of its formal parameters; the signature does not include the method’s return type.

大部情况下，本书使用的技术术语来自语音java8的语言规范上的术语。很少的术语会有特殊的说明。java语音支持四种类型：接口(包括注解),类（包括枚举），数组和原生态类型。前三种是引用类型。类的示例和数组都是对象，原生态数据类型不是。一个类的成员包括：属性字段，方法，成员类，成员接口。一个方法签名签名包括它的名称，形式参数，方法签名不包括方法返回类型。

This book uses a few terms differently from The Java Language Specification.

Unlike The Java Language Specification, this book uses inheritance as a synonym

for subclassing. Instead of using the term inheritance for interfaces, this book simply states that a class implements an interface or that one interface extends

another. To describe the access level that applies when none is specified, this book uses the traditional package-private instead of the technically correct package access [JLS, 6.6.1].

本书使用了一些术语与java规范不太一样。与java规范相比不同的是，本书使用继承作为子类化的同义词。为了替代术语“接口继承”，本书简单的把类实现接口和接口继承接口通称为继承。为描述没有指定访问级别，本书使用了传统的包私有替代专业上正确的包访问。

This book uses a few technical terms that are not defined in The Java Language

Specification. The term exported API, or simply API, refers to the classes,

interfaces, constructors, members, and serialized forms by which a programmer

accesses a class, interface, or package. (The term API, which is short for application programming interface, is used in preference to the otherwise preferable term interface to avoid confusion with the language construct of that name.) A programmer who writes a program that uses an API is referred to as a user of the API. A class whose implementation uses an API is a client of the API.

本书还使用了一些java规范中没有定义的专业术语。对API(或者是指普通的API)术语进行扩展，扩展的术语API指接口，构造函数，成员变量，和程序员可以访问类，接口或者包的可序列化的形式。（API是应用程序接口的缩写，他比其他可取的术语---“接口”更优先使用，因为可以避免与java语言本身结构中的接口术语相混淆）

Classes, interfaces, constructors, members, and serialized forms are collectively known as API elements. An exported API consists of the API elements that are accessible outside of the package that defines the API. These are the API elements that any client can use and the author of the API commits to support. Not coincidentally, they are also the elements for which the Javadoc utility generates documentation in its default mode of operation. Loosely speaking, the exported API of a package consists of the public and protected members and constructors of every public class or interface in the package.

类，接口，构造函数按的序列化形式都的被以API元素的形式所知晓。一个扩展的API包括的API元素，可以访问包以为定义的API。这里的API可以被人任何客户端使用并且API提供者会对它提供支持。无独有偶，这些API就是JAVADOC工具以默认形式产生的文档。笼统说，扩展AIP是包括了包中每个类的公共构造函数，公共和保护成员以及接口。

In Java 9, a module system was added to the platform. If a library makes use of the module system, its exported API is the union of the exported APIs of all the packages exported by the library’s module declaration.

在java9中，一个模块化的系统被加到平台中，如果一个库函数使用模块化系统，他的扩展API是一个并集，这个集合中包括所有的扩展包的所以扩展API，这些扩展包都是通过库的模块化声明进行扩展。

Creating and Destroying Objects

对象的创建和销毁

This chapter concerns creating and destroying objects: when and how to create

them, when and how to avoid creating them, how to ensure they are destroyed in a

timely manner, and how to manage any cleanup actions that must precede their

destruction.

本章关注的是对象的创建和销毁:何时怎样创建对象，什么时间以及怎样避免创建对象，如何确保他们及时进行销毁，最后怎样管理对象的清理工作，这些清理工作必须在他们销毁执行进行。

Item 1: Consider static factory methods instead of constructors

第1款:考虑用静态工厂方法替代构造函数

The traditional way for a class to allow a client to obtain an instance is to provide a public constructor. There is another technique that should be a part of every programmer’s toolkit. A class can provide a public static factory method, which is simply a static method that returns an instance of the class. Here’s a simple example from Boolean (the boxed primitive class for boolean). This method translates a boolean primitive value into a Boolean object reference:

public static Boolean valueOf(boolean b) {

return b ? Boolean.TRUE : Boolean.FALSE;

}

Note that a static factory method is not the same as the Factory Method pattern from Design Patterns [Gamma95]. The static factory method described in this item has no direct equivalent in Design Patterns.

传统的获取类实例的方法是运行客户端访问类提供的公共构造函数。还有另外一种技术，应该作为每个程序员的工具包里的一部分：一个类应该提供一个静态工厂方法，这个方法是普通的静态方法，它返回一个类的实例对象。这里有一个来自Boolean（原始数据类型boolean的包装类）的简单示例。该方法把boolean的原始值转变为Boolean类的引用类型：

public static Boolean valueOf(boolean b) {

return b ? Boolean.TRUE : Boolean.FALSE;

}

注意，这静态工厂方法与设计模式中的静态工厂方法不一样。这本条款中的静态工厂方法与设计模式不是直接等效。

A class can provide its clients with static factory methods instead of, or in addition to, public constructors. Providing a static factory method instead of a public constructor has both advantages and disadvantages.

一个类为客户端除了公共构造方法之前，还应该提供静态工厂方法。利用静态构造方法来代替公共构造函数优缺点并存。

One advantage of static factory methods is that, unlike constructors, they have names. If the parameters to a constructor do not, in and of themselves, describe the object being returned, a static factory with a well-chosen name is easier to use and the resulting client code easier to read. For example, the constructor BigInteger(int, int, Random), which returns a BigInteger that is probably prime, would have been better expressed as a static factory method

named BigInteger.probablePrime. (This method was added in Java 4.)

第一个优点，与构造方法不同，静态工厂方法有自己名字。如果通过构造函数的参数本身不能够描述该构造方法将要返回的对象，此时，静态工厂方法可使用一个描述准确的名字的是非常容易，并且客户端代码易读性也强。例如，构造函数BigInteger(int, int, Random)可能返回BigInteger对象是一个素数，但如果使用静态工厂方法BigInteger.probablePrime，那么描述的就更清晰。

A class can have only a single constructor with a given signature. Programmers have been known to get around this restriction by providing two constructors whose parameter lists differ only in the order of their parameter types. This is a really bad idea. The user of such an API will never be able to remember which constructor is which and will end up calling the wrong one by mistake. People reading code that uses these constructors will not know what the code does without referring to the class documentation.

一个类的一个函数签名只能定义一个构造函数。大家都知道程序员为了应对这种限制，提供两个构造函数，这两个构造函数的参数列表仅仅可能是参数类型不同。这是一个比较差的办法。使用静态工厂方法的这种API将不会需要程序员记住哪个构造方法对应哪个实例，并且避免由于失误导致调用了错误的构造函数。用户在阅读使用这样的构造方法的代码时，如果没有相关的类说明文档，将不会明白代码所表达的含义。

Because they have names, static factory methods don’t share the restriction discussed in the previous paragraph. In cases where a class seems to require multiple constructors with the same signature, replace the constructors with static factory methods and carefully chosen names to highlight their differences.

由于精通工厂方法有自己的名称，静态工厂方法就不会有上一段落所讨论的那些限制。在这样的情况下，一个类似乎需要多个拥有相同签名的构造函数，使用静态工厂方法取代构造函数，需要给静态工厂方法仔细选择能够区别彼此的名称。

A second advantage of static factory methods is that, unlike constructors, they are not required to create a new object each time they’re invoked. This allows immutable classes (Item 17) to use preconstructed instances, or to cache instances as they’re constructed, and dispense them repeatedly to avoid creating unnecessary duplicate objects. The Boolean.valueOf(boolean) method illustrates this technique: it never creates an object. This technique is similar to the Flyweight pattern [Gamma95]. It can greatly improve performance if equivalent objects are requested often, especially if they are expensive to create.

静态工厂方法的第二个优点是，在他每次调用的时候，不需要创建一个新的对象，这一点与构造方法不同。这种方式允许不可变类（条款17）使用预构造的实例或者是之前缓存的构造实例，这样可以反复的避免创建多个不必要的重复对象。Boolean.valueOf(boolean)这个方法也证明了这种技巧：它不会创建新的对象。这个技巧似乎与享元模式类似。当每次需要相同的对象，并且他们的创建是重量级的，那么这种方式非常有助于提高性能。

The ability of static factory methods to return the same object from repeated invocations allows classes to maintain strict control over what instances exist at any time. Classes that do this are said to be instance-controlled. There are several reasons to write instance-controlled classes. Instance control allows a class to guarantee that it is a singleton (Item 3) or noninstantiable (Item 4). Also, it allows an immutable value class (Item 17) to make the guarantee that no two equal instances exist: a.equals(b) if and only if a == b. This is the basis of the Flyweight pattern [Gamma95]. Enum types (Item 34) provide this guarantee.

静态工厂方法拥有重复调用静态工厂方法产生同一个对象的能力，这种的能力允许类可以严格控制什么时候出现什么实例。这被称为类的实例控制。编写实例控制类有几个原因：1.可以保证类的单例或者不能实例化。2.保证类实例的不变性，可以保证不会存在两个相等的对象存储：如果a.equals(b)那么有且仅有a==b。这是享员模式的最基本原则。枚举类型提供了这种的保证。

**A third advantage of static factory methods is that, unlike constructors, they can return an object of any subtype of their return type.** This gives yougreat flexibility in choosing the class of the returned object.

与构造函数不同的第三个优点：他们可以返回实例类的子类。这就给了开发人员在选择类的返回值是提供了很大的灵活性。

One application of this flexibility is that an API can return objects without making their classes public. Hiding implementation classes in this fashion leads to a very compact API. This technique lends itself to *interface-based frameworks*(Item 20), where interfaces provide natural return types for static factory methods.

灵活性的一个应用是一个API可以返回非public声明的对象。隐藏类的实现的方式，可以使API设计变的紧凑。这种技术导致自己成为面向接口编程的框架，在这些地方静态工厂方法自然就会返回接口类型。

Prior to Java 8, interfaces couldn’t have static methods. By convention, static factory methods for an interface named *Type* were put in a *noninstantiable companion* *class* (Item 4) named *Types.* For example, the Java Collections Framework has forty-five utility implementations of its interfaces, providing unmodifiable collections, synchronized collections, and the like. Nearly all of these implementations are exported via static factory methods in one noninstantiable class (java.util.Collections). The classes of the returned objects are all nonpublic.

在java8之前，接口类型是不能拥有静态方法的。按照约定，Type的接口类型的静态工厂方法，将会被放到一个以Types命名且不能实例化的Type接口伴侣类里。例如，java Collections Framework有45个实现接口的例子，这些静态工厂方法产生不可变的,同步的等等集合类型。几乎所有这些实现都是在不可变类(java.util.Collections)中的静态工厂方法中发布的。这些方法返回的对象所属的类都不是公共类型。

The Collections Framework API is much smaller than it would have been had it exported forty-five separate public classes, one for each convenience implementation. It is not just the *bulk* of the API that is reduced but the *conceptual weight:* the number and difficulty of the concepts that programmers must master in order to use the API. The programmer knows that the returned object has precisely the API specified by its interface, so there is no need to read additional class documentation for the implementation class. Furthermore, using such a static factory method requires the client to refer to the returned object by interface rather than implementation class, which is generally good practice (Item 64).

JAVA集合框架API比他能导出的45个独立的公共类少的多，每个类都有对于的便利的实现。这不仅仅是API数量的减少，而是概念上加重了。这些API的概念的数量和难度都增加了，这些要求程序员必须精通才能取使用它。程序员需要知道这些返回的对象所拥有的清晰的API，这些API是这些实例所指定的。另外，使用静态工厂方法需要客户端去指定接口作为返回对象，而不是实现类，这个在实践中很适用。

As of Java 8, the restriction that interfaces cannot contain static methods was eliminated, so there is typically little reason to provide a noninstantiable companion class for an interface. Many public static members that would have been at home in such a class should instead be put in the interface itself. Note, however, that it may still be necessary to put the bulk of the implementation code behind these static methods in a separate package-private class. This is because Java 8 requires all static members of an interface to be public. Java 9 allows private static methods, but static fields and static member classes are still required to be public.

作为JAVA8，接口不能报考静态方法的限制已经消失了，因此这里就不需要提供一个接口的不可变伴侣类。类中大部分公共静态成员应该被放到接口定义中。注意，然后，独立的包私有类中有大量的静态方法的实现，这仍然是很有必要的。这是因为java8需要接口中所有的静态成员必须是public类型。java9允许private静态方法，但是静态属性和静态成员类仍然必须是public。

**A fourth advantage of static factories is that the class of the returned object can vary from call to call as a function of the input parameters.** Any subtypeof the declared return type is permissible. The class of the returned object canalso vary from release to release.

The EnumSet class (Item 36) has no public constructors, only static factories. In the OpenJDK implementation, they return an instance of one of two subclasses, depending on the size of the underlying enum type: if it has sixty-four or fewer elements, as most enum types do, the static factories return a RegularEnumSet instance, which is backed by a single long; if the enum type has sixty-five or more elements, the factories return a JumboEnumSet instance, backed by a long array.

The existence of these two implementation classes is invisible to clients. If RegularEnumSet ceased to offer performance advantages for small enum types, it could be eliminated from a future release with no ill effects. Similarly, a future release could add a third or fourth implementation of EnumSet if it proved beneficial for performance. Clients neither know nor care about the class of the object they get back from the factory; they care only that it is some subclass of EnumSet.