

## Package java.lang

Provides classes that are fundamental to the design of the Java programming language.

See: [Description](#)      提供 Java 语言设计的基础类

Interface Summary		
Interface		Description
<b>Appendable</b>	字符序列和值可追加	An object to which <u>char sequences and values can be appended</u> .
<b>AutoCloseable</b>	一个资源在不必要时必须关闭 try-with-resources	A <b>resource</b> that <u>must be closed</u> when it is no longer needed.
<b>CharSequence</b>	一个可读的字符值序列	A <b>CharSequence</b> is <u>a readable sequence of char values</u> .
<b>Cloneable</b>		A class implements the <b>Cloneable</b> interface to indicate to the <b>Object.clone()</b> method that it is legal for that method to make a field-for-field copy of instances of that class.
<b>Comparable&lt;T&gt;</b>	暴露类型对象集的总排序	This interface <u>imposes a total ordering on the objects</u> of each class that implements it.
<b>Iterable&lt;T&gt;</b>	允许对象用于foreach语句	Implementing this interface <u>allows an object to be the target of the "foreach" statement</u> .
<b>Readable</b>		A <b>Readable</b> is a source of characters.
<b>Runnable</b>	任何类型的实例想在线程中被执行都必须实现该接口	The <b>Runnable</b> interface <u>should be implemented by any class whose instances are intended to be executed by a thread</u> .
<b>Thread.UncaughtExceptionHandler</b>	当线程因为一个不可捕获的异常而粗鲁地终止时，该处理器会被调用	Interface for handlers invoked when <u>a Thread abruptly terminates due to an uncaught exception</u> .

Class Summary	
Class	Description
<b>Boolean</b>	The <b>Boolean</b> class <u>wraps a value of the primitive type boolean</u> in an object. <span>基本类型的包装类</span>
<b>Byte</b>	The <b>Byte</b> class wraps a value of primitive type <b>byte</b> in an object.
<b>Character</b>	The <b>Character</b> class wraps a value of the primitive type <b>char</b> in an object.
<b>Character.Subset</b>	Instances of this class represent particular subsets of the Unicode character set.
<b>Character.UnicodeBlock</b>	A family of character subsets representing the character blocks in the Unicode specification.
<b>Class&lt;T&gt;</b>	<u>Instances of the class Class represent classes and interfaces</u> in a running Java application. <span>表示类型和接口的类型实例</span>
<b>ClassLoader</b>	A <b>class loader</b> is an object that is <u>responsible for loading classes</u> . <span>负责加载类型的类加载器</span>
<b>ClassValue&lt;T&gt;</b>	Lazily associate a computed value with (potentially) every type.
<b>Compiler</b>	The <b>Compiler</b> class is provided to <u>support Java-to-native-code compilers and related services</u> . <span>支持“Java到本地代码”的编译器和相关的服务</span>
<b>Double</b>	The <b>Double</b> class wraps a value of the primitive type <b>double</b> in an object.
<b>Enum&lt;E extends Enum&lt;E&gt;&gt;</b>	This is the <u>common base class of all Java language enumeration types</u> . <span>所有枚举类型的公共基类</span>
<b>Float</b>	The <b>Float</b> class wraps a value of primitive type <b>float</b> in an object.
<b>InheritableThreadLocal&lt;T&gt;</b>	This class <u>extends ThreadLocal to provide inheritance of values from parent thread to child thread</u> : when a child thread is created, <u>the child receives initial values for all inheritable thread-local variables for which the parent has values</u> . <span>扩展线程本地变量，提供从父线程到子线程的值的继承</span>
<b>Integer</b>	The <b>Integer</b> class wraps a value of the primitive type <b>int</b> in an object.

<b>Long</b>		The Long class wraps a value of the primitive type <b>long</b> in an object.
<b>Math</b>	提供基本的数字操作	The class Math contains methods for <u>performing basic numeric operations</u> such as the elementary exponential, logarithm, square root, and trigonometric functions.
<b>Number</b>	所有数字类型的超类	The abstract class <b>Number</b> <u>is the superclass of classes</u> BigDecimal, BigInteger, Byte, Double, Float, Integer, Long, and Short.
<b>Object</b>	类层次的根类	Class Object is the <u>root of the class hierarchy</u> .
<b>Package</b>	包含实现的版本信息和包的规范	Package objects <u>contain version information about the implementation and specification of a Java package</u> .
<b>Process</b>	表示本地进程	The <b>ProcessBuilder.start()</b> and <b>Runtime.exec</b> methods create <u>a native process</u> and return an instance of a subclass of <b>Process</b> that can be used to control the process and obtain information about it.
<b>ProcessBuilder</b>	用于创建操作系统进程	This class is <u>used to create operating system processes</u> .
<b>ProcessBuilder.Redirect</b>	表示子进程的输入源或输出地	<u>Represents a source of subprocess input</u> or a <u>destination of subprocess output</u> .
<b>Runtime</b>	每个 Java 应用程序都有一个运行时类型的单例	<u>Every Java application has a single instance of class Runtime</u> that allows the application to interface with the environment in which the application is running.
<b>RuntimePermission</b>	安全管理器：允许应用实现一个安全策略	This class is for <u>runtime permissions</u> .
<b>SecurityManager</b>		The <u>security manager</u> is a class that <u>allows applications to implement a security policy</u> .
<b>Short</b>		The Short class wraps a value of primitive type short in an object.
<b>StackTraceElement</b>	堆栈追踪元素	<u>An element in a stack trace</u> , as returned by <b>Throwable.getStackTrace()</b> .
<b>StrictMath</b>		The class StrictMath contains methods for performing basic numeric operations such as the elementary exponential, logarithm, square root, and trigonometric functions.
<b>String</b>	表示字符串（不可变类）	The String class <u>represents character strings</u> .
<b>StringBuffer</b>	线程安全、可变的字符序列	A <u>thread-safe, mutable sequence of characters</u> .
<b>StringBuilder</b>	可变的字符序列	A <u>mutable sequence of characters</u> .
<b>System</b>	包含一些有用的类型字段和方法	The System class <u>contains several useful class fields and methods</u> .
<b>Thread</b>	程序中的执行线程	A <u>thread is a thread of execution</u> in a program.
<b>ThreadGroup</b>	线程组：表示一组线程	A thread group <u>represents a set of threads</u> .
<b>ThreadLocal&lt;T&gt;</b>	提供线程本地变量	This class <u>provides thread-local variables</u> .
<b>Throwable</b>	所有错误和异常的超类	The Throwable class is the <u>superclass of all errors and exceptions</u> in the Java language.
<b>Void</b>		The Void class is <u>an uninstantiable placeholder class to hold a reference to the Class object representing the Java keyword void</u> .

Enum Summary		
Enum	Description	
<b>Character.UnicodeScript</b>	A family of character subsets representing the character scripts defined in the <i>Unicode Standard Annex #24: Script Names</i> .	
<b>ProcessBuilder.Redirect.Type</b>	The type of a <b>ProcessBuilder.Redirect</b> .	
<b>Thread.State</b>	线程状态	A <u>thread state</u> .

Exception Summary	
Exception	Description
<b>ArithmeticException</b>	Thrown when an exceptional arithmetic condition has occurred.

<b>ArrayIndexOutOfBoundsException</b>	Thrown to indicate that <b>an array</b> has been <u>accessed with an illegal index</u> .
<b>ArrayStoreException</b>	Thrown to indicate that an attempt has been made to <u>store the wrong type of object into an array of objects</u> .
<b>ClassCastException</b>	Thrown to indicate that the code has attempted to <u>cast an object to a subclass</u> of which it is not an instance.
<b>ClassNotFoundException</b>	Thrown when an application <u>tries to load in a class through its string name</u> using: The <u>forName method in class Class</u> .
<b>CloneNotSupportedException</b>	Thrown to indicate that the clone method in class Object has been called to clone an object, but that the object's class does not implement the Cloneable interface.
<b>EnumConstantNotPresentException</b>	Thrown when an application tries to access an enum constant by name and the enum type contains no constant with the specified name.
<b>Exception</b> 异常及其子类都是可抛出类型的一种	The class <u>Exception</u> and its subclasses are a form of <u>Throwable</u> that indicates conditions that a reasonable application might want to catch.
<b>IllegalAccessException</b>	An IllegalAccessException is thrown when an application tries to <u>reflectively create an instance</u> (other than an array), set or get a field, or invoke a method, but the currently executing method does not have access to the definition of the specified class, field, method or constructor.
<b>IllegalArgumentException</b> 一个方法被传递了非法或不合适的参数	Thrown to indicate that <b>a method</b> <u>has been passed an illegal or inappropriate argument</u> .
<b>IllegalMonitorStateException</b>	Thrown to indicate that <b>a thread</b> has attempted to <u>wait on an object's monitor</u> or to <u>notify other threads waiting on an object's monitor</u> without owning the specified monitor.
<b>IllegalStateException</b> 一个方法在非法或不合理的时间被调用	Signals that <b>a method</b> <u>has been invoked at an illegal or inappropriate time</u> .
<b>IllegalThreadStateException</b>	Thrown to indicate that a thread is not in an appropriate state for the requested operation.
<b>IndexOutOfBoundsException</b> 索引越界异常	Thrown to indicate that <b>an index</b> of some sort (such as to an array, to a string, or to a vector) <u>is out of range</u> .
<b>InstantiationException</b>	Thrown when an application tries to create an instance of a class using the <u>newInstance</u> method in class Class, but the <u>specified class object cannot be instantiated</u> .
<b>InterruptedException</b> 线程被中断	Thrown when a thread is waiting, sleeping, or otherwise occupied, and the <b>thread</b> <u>is interrupted</u> , either before or during the activity.
<b>NegativeArraySizeException</b>	Thrown if an application tries to create an array with negative size.
<b>NoSuchFieldException</b>	Signals that the class doesn't have a field of a specified name.
<b>NoSuchMethodException</b>	Thrown when a <u>particular method cannot be found</u> . 反射时才会出现
<b>NullPointerException</b> 试图使用 null 对象	Thrown when an application <u>attempts to use null</u> in a case <u>where an object is required</u> .
<b>NumberFormatException</b>	Thrown to indicate that the application has attempted to <u>convert a string to one of the numeric types</u> , but that the string does not have the appropriate format.
<b>ReflectiveOperationException</b>	Common superclass of <u>exceptions thrown by reflective operations</u> in core reflection. 反射操作异常
<b>RuntimeException</b> JVM 正常操作期间抛出的所有异常的超类	RuntimeException is the <u>superclass of those exceptions</u> that can be <u>thrown during the normal operation of the Java Virtual Machine</u> .
<b>SecurityException</b>	Thrown by the security manager to indicate a security violation.
<b>StringIndexOutOfBoundsException</b>	Thrown by String methods to indicate that an index is either negative or greater than the size of the string.
<b>TypeNotPresentException</b>	Thrown when an application tries to access a type using a string representing the type's name, but no definition for the type with the specified name can be found.

**UnsupportedOperationException**Thrown to indicate that the requested operation is not supported.

请求的操作不支持

**Error Summary**

Error	Description
<b>AbstractMethodError</b>	Thrown when an application tries to call an abstract method.
<b>AssertionError</b>	Thrown to indicate that <u>an assertion has failed</u> .
<b>BootstrapMethodError</b>	Thrown to indicate that an <u>invokedynamic</u> instruction has failed to find its bootstrap method, or the bootstrap method has failed to provide a <b>call site</b> with a <b>target</b> of the correct <b>method type</b> .
<b>ClassCircularityError</b>	Thrown when the Java Virtual Machine <u>detects a circularity in the superclass hierarchy of a class</u> being loaded.
<b>ClassFormatError</b>	Thrown when the Java Virtual Machine attempts to read a class file and determines that the file is malformed or otherwise cannot be interpreted as a class file.
<b>Error</b>	An <b>Error</b> is a subclass of <b>Throwable</b> that <u>indicates serious problems</u> that a reasonable <u>application should not try to catch</u> .
<b>ExceptionInInitializerError</b>	Signals that <u>an unexpected exception has occurred in a static initializer</u> .
<b>IllegalAccessError</b>	Thrown if an application attempts to access or modify a field, or to call a method that it does not have access to.
<b>IncompatibleClassChangeError</b>	Thrown when <u>an incompatible class change has occurred</u> to some class definition.
<b>InstantiationError</b>	Thrown when an application tries to use the Java new construct to instantiate an abstract class or an interface.
<b>InternalError</b>	Thrown to indicate some unexpected internal error has occurred in the Java Virtual Machine.
<b>LinkageError</b>	Subclasses of <b>LinkageError</b> indicate that <u>a class has some dependency on another class; however, the latter class has incompatibly changed</u> after the compilation of the former class.
<b>NoClassDefFoundError</b>	Thrown if the Java Virtual Machine or a <b>ClassLoader</b> instance tries to load in the definition of a class (as part of a normal method call or as part of creating a new instance using the new expression) and <u>no definition of the class could be found</u> .
<b>NoSuchFieldError</b>	Thrown if an application tries to access or modify a specified field of an object, and that object no longer has that field.
<b>NoSuchMethodError</b>	Thrown if an application tries to call a specified method of a class (either static or instance), and that <u>class no longer has a definition of that method</u> .
<b>OutOfMemoryError</b> 没有更多的内存分配对象	Thrown when the Java Virtual Machine <u>cannot allocate an object because it is out of memory</u> , and <u>no more memory could be made available by the garbage collector</u> .
<b>StackOverflowError</b> 应用递归地太深发生栈溢出	Thrown when <u>a stack overflow occurs because an application recurses too deeply</u> .
<b>ThreadDeath</b>	An instance of <b>ThreadDeath</b> is thrown in the victim thread when the (deprecated) <b>Thread.stop()</b> method is invoked.
<b>UnknownError</b>	Thrown when an unknown but serious exception has occurred in the Java Virtual Machine.
<b>UnsatisfiedLinkError</b>	Thrown if the Java Virtual Machine <u>cannot find an appropriate native-language definition of a method declared native</u> .
<b>UnsupportedClassVersionError</b>	Thrown when the Java Virtual Machine attempts to read <u>a class file and determines that the major and minor version numbers in the file are not supported</u> .
<b>VerifyError</b>	Thrown when the "verifier" detects that a class file, though well formed, contains some sort of internal inconsistency or security problem.
<b>VirtualMachineError</b>	Thrown to indicate that the Java Virtual Machine is broken or has run out of resources necessary for it to continue operating.

Annotation Types Summary	
Annotation Type	Description
Deprecated	A program element annotated @Deprecated is one that programmers are discouraged from using, typically because it is dangerous, or because a better alternative exists.
Override	Indicates that a method declaration is intended to override a method declaration in a supertype.
SafeVarargs	A programmer assertion that the body of the annotated method or constructor does not perform potentially unsafe operations on its varargs parameter.
SuppressWarnings	Indicates that the named compiler warnings should be suppressed in the annotated element (and in all program elements contained in the annotated element).

## Package java.lang Description

提供设计的基础类  
Provides classes that are fundamental to the design of the Java programming language. The most important classes are `Object`, which is the root of the class hierarchy, and `Class`, instances of which represent classes at run time.

基本类型的包装类  
Frequently it is necessary to represent a value of primitive type as if it were an object. The wrapper classes `Boolean`, `Character`, `Integer`, `Long`, `Float`, and `Double` serve this purpose. An object of type `Double`, for example, contains a field whose type is `double`, representing that value in such a way that a reference to it can be stored in a variable of reference type. These classes also provide a number of methods for converting among primitive values, as well as supporting such standard methods as `equals` and `hashCode`. The `Void` class is a non-instantiable class that holds a reference to a `Class` object representing the type `void`.

The class `Math` provides commonly used mathematical functions such as sine, cosine, and square root. The classes `String`, `StringBuffer`, and `StringBuilder` similarly provide commonly used operations on character strings.

提供公共的字符串操作  
Classes `ClassLoader`, `Process`, `ProcessBuilder`, `Runtime`, `SecurityManager`, and `System` provide "system operations" that manage the dynamic loading of classes, creation of external processes, host environment inquiries such as the time of day, and enforcement of security policies.

提供系统操作  
Class `Throwable` encompasses objects that may be thrown by the `throw` statement. Subclasses of `Throwable` represent errors and exceptions.

Throwable 的子类表示错误和异常

## Character Encodings 字符编码

描述字符编码的命名规范  
The specification of the `java.nio.charset.Charset` class describes the naming conventions for character encodings as well as the set of standard encodings that must be supported by every implementation of the Java platform.

Since:  
JDK1.0