

Glossary

Java for Beginners

Welcome! This alphabetized glossary contains many terms used in this course. Understanding these terms is essential when working in the industry, participating in user groups, and participating in other certificate programs.

Term	Definition
A	
Abstract class	A class that cannot be instantiated and can have abstract methods.
Abstract method	A method without a body that subclasses of an abstract class must implement.
Abstract method error	An error that occurs when an application attempts to call an abstract method directly.
Abstraction	The concept of hiding implementation details and exposing functionality.
Access control exception	A security-related exception that occurs when an operation is not allowed due to insufficient permissions.
Access modifier	A keyword that defines the scope and visibility of a class, method, or variable (for example, public, private, or protected).
Annotation	A metadata tag in code that provides information to the compiler or at runtime and is often used for configuration or code generation.

API (Application Programming Interface)	A set of functions and protocols for building and integrating applications.
Applet	A small Java program that runs within a web browser or applet viewer.
Argument	A value that is passed to a function or method when it is called.
Arithmetic exception	An unchecked exception that occurs when an exceptional arithmetic condition arises, such as division by zero.
Array	A fixed-size collection of elements of the same type.
Array index out of bounds exception	An unchecked exception that is thrown when attempting to access an array with an invalid index.
ArrayList	A resizable implementation of the list interface in Java.
Assertion error	An error that occurs when an assertion statement fails, typically used for debugging.
Autoboxing	The automatic conversion of a primitive data type into its corresponding wrapper class object.
B	
Boolean	A data type that represents one of the two values: true or false.
Break statement	A statement that exits a loop or switch statement when executed.
BufferedReader	A class used for efficient reading of text from input streams.
Bytecode	A low-level, platform-independent code generated by the Java compiler that runs on the Java Virtual Machine (JVM).
C	
Casting	The process of converting one data type into another.
Catch block	A block of code used to handle exceptions in a try-catch structure.

charAt	A method used to access a character at a specific index in a string.
Checked exception	An exception that must be declared in the method signature or handled using a try-catch block.
Child class	A class that inherits from another class.
Clarity	A benefit of comments that clarify complex logic, making it easier to understand.
Class	A blueprint for creating objects in Java.
Class attribute	A variable that is declared within a class and used to store object data.
ClassCastException	An unchecked exception that occurs when an object is cast to an incompatible class.
ClassLoader	A part of the Java Runtime Environment (JRE) responsible for dynamically loading classes into memory.
ClassNotFoundException	A checked exception that occurs when an application tries to load a class by name but can't find it.
CloneNotSupportedException	A checked exception that occurs when an object does not implement the Cloneable interface but is being cloned.
Collaboration	A benefit of comments that helps team members understand each other's work in a team environment.
Comment	A note in the code that is not executed by the program and is used to explain, clarify, or annotate parts of the code for developers.
Comparable	An interface that allows objects to be sorted based on natural ordering.
Comparator	An interface used for defining custom sorting logic.
Concatenation	The process of combining two or more strings.

ConcurrentModificationException	An unchecked exception that occurs when a collection is modified while being iterated.
Constructor	A special method used to initialize objects.
Continue statement	A control statement that skips the current iteration of a loop and proceeds with the next iteration.
Custom exception	A user-defined exception class that extends Exception or RuntimeException.
D	
Data encapsulation	The practice of restricting direct access to object data and allowing manipulation through methods.
Data hiding	The concept of making class variables private and accessible only through public methods to ensure security.
Deadlock	A condition where two or more threads are blocked forever, each waiting for the other to release resources.
Default exception handler	The Java runtime's built-in mechanism for handling uncaught exceptions by printing the stack trace.
Deque (Double-ended queue)	A data structure that allows insertion and deletion from both ends.
Deserialization	The process of converting a byte stream back into an object.
Documentation comment	A comment that is used for generating documentation using tools such as Javadoc.
do-while loop	A control structure that executes a block of code at least once before checking the condition.
Dynamic binding	The process of resolving method calls at runtime instead of compile time.
E	
Encapsulation	The practice of keeping data private and providing controlled access.

Entry point	A starting method of a Java application, typically the main method.
enum	A special class representing a fixed set of constants.
EOFException	A checked exception that occurs when an end-of-file condition is unexpectedly reached during input.
equals method	A method that compares the values of two strings or objects for equality.
Error	A subclass of Throwable that represents serious problems that an application should not attempt to catch.
Exception	An event that disrupts the normal execution of a program, requiring special handling.
Exception chaining	A mechanism where one exception is caused by another, maintaining the cause of an exception.
Exception handling	A programming mechanism for handling runtime errors and ensuring smooth program execution.
Exception hierarchy	The structured classification of exceptions in Java, where all exceptions derive from Throwable.
Explicit casting	A type conversion that requires the programmer to specify the target type.
extends keyword	A keyword used by a class to indicate that it is inheriting from another class.
F	
File	A class representing file and directory paths in Java.
final class	A class that cannot be extended or subclassed.
final keyword	A keyword used to declare constants, prevent method overriding, or prevent inheritance.
finally block	A block of code that executes after a try-catch structure, regardless of whether an exception occurs.

Float	A primitive data type that represents decimal numbers with single precision.
Folder structure for packages	A directory structure on the filesystem that should match the package declaration.
For loop	A control flow statement that executes a block of code a fixed number of times.
G	
Garbage collection	The automatic process of reclaiming unused memory in Java to prevent memory leaks.
Generic class	A class that can work with different data types using type parameters.
Generics	A feature enabling type-safe operations on collections and classes.
H	
HashMap	A data structure that stores key-value pairs, allowing fast retrieval of values based on keys.
Heap memory	A memory area where objects are dynamically allocated at runtime.
I	
if-else	A conditional statement that executes different code based on conditions.
IllegalArgumentException	An unchecked exception that occurs when an illegal or inappropriate argument is passed to a method.
IllegalStateException	An unchecked exception that occurs when a method is invoked at an inappropriate time.
IllegalThreadStateException	An unchecked exception that occurs when a thread is in an inappropriate state for the requested operation.
Immutable object	An object whose state cannot be changed after creation.
Immutable	A property of String, meaning it cannot be modified after creation.
implements keyword	A keyword used by a class to indicate that it is implementing an interface.

Import statement	A statement that is used to include classes from other packages in a Java source file.
import	A statement used to bring external classes or packages into a program.
IndexOutOfBoundsException	A superclass of exceptions that occur when accessing an index out of the valid range for an array or list.
Infinite loop	A loop that runs indefinitely due to a missing or incorrect termination condition.
Inheritance	A mechanism where a subclass derives properties and behaviors from a parent class.
InputMismatchException	An unchecked exception that occurs when input does not match the expected data type.
InputStream	A class used for reading byte streams.
Instance method	A method associated with an instance of a class, requiring an object to be invoked.
Interface	A blueprint for a class that defines abstract methods, which must be implemented by subclasses.
InterruptedException	A checked exception that occurs when a thread is interrupted while waiting or sleeping.
Iterator	An object that provides a way to traverse elements in a collection sequentially.
J	
Java Archive (JAR)	A package file format that contains compiled Java classes and resources.
Java Development Kit (JDK)	A software development kit used to develop Java applications, including a compiler and libraries.
Java Runtime Environment (JRE)	A software package that provides the libraries and components needed to run Java applications.
Java Virtual Machine (JVM)	A virtual machine that executes Java bytecode and provides platform independence.
java.io	A package that handles input and output operations.

java.lang	A built-in package that contains fundamental Java classes.
java.net	A package that provides networking capabilities.
java.sql	A package used for database connectivity.
java.time	A package introduced in Java 8 for modern date and time handling.
java.util	A package that provides utility classes for data structures and algorithms.
JDBC (Java Database Connectivity)	An API for database interaction.
join	A method that combines elements of an array into a single string.
L	
Lambda expression	A concise way to represent anonymous functions in Java, often used in functional programming.
Lambda	A concise way to represent anonymous functions introduced in Java 8.
length method	A method that returns the length of a string or an array.
length	A method that returns the number of characters in a string.
List	A collection that maintains an ordered sequence of elements and allows duplicates.
Local variable	A variable declared inside a method or block, accessible only within that scope.
Logical error	An error in a program that causes incorrect results but does not throw an exception.
Loop	A control structure used to execute a block of code repeatedly while a condition is true.
M	
main class	A class in a Java application that contains the main method, serving as the entry point.
Maintenance	A benefit of comments that provides context, making it easier to understand the code when revisiting it later.
Math class	A class in Java that provides mathematical functions such as sqrt, pow, and abs.

Method overloading	Defining multiple methods with the same name but different parameter lists in the same class.
Method overriding	Redefining a method in a subclass that is already defined in a parent class.
Method signature	A unique identifier of a method, consisting of its name and parameter list.
Method signature	The combination of a method name and parameter list that defines a method.
Method	A block of code that performs a specific task when called.
Method	A function that is defined inside a class and performs a specific action.
Method	A block of code that performs a specific task in a class.
Module	A feature introduced in Java 9 for better dependency management.
Multi-catch block	A catch block that handles multiple exception types using a single catch block.
Multi-line comment	A comment that spans multiple lines.
Multithreading	A programming technique that allows multiple threads to run concurrently.
Mutable object	An object whose state can be changed after creation.
N	
NegativeArraySizeException	An unchecked exception that occurs when an attempt is made to create an array with a negative size.
Nested class	A class defined inside another class.
Nested try block	A try block inside another try block, allowing for more specific exception handling.
new	A keyword used to create a new object explicitly.
nextInt method	A method that reads an integer input using Scanner.
nextLine method	A method that reads an entire line of input using Scanner.
null keyword	A keyword that represents an absence of value in an object reference.
NullPointerException	A runtime exception that occurs when attempting to access an object reference that is null.

NumberFormatException	An unchecked exception that occurs when attempting to convert a string to a number, but the string is invalid.
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O

Object instantiation	A process of creating an instance of a class using the new keyword.
Object	An instance of a class that encapsulates state (fields) and behavior (methods).
Optional	A container object introduced in Java 8 to handle null values safely.
OutOfMemoryError	An error that occurs when the Java Virtual Machine (JVM) runs out of heap memory.
OutputStream	A class used for writing byte streams.
Overloading	The process of defining multiple methods with the same name but different parameters.
Overriding	A process of defining a method in a subclass that replaces a method in the parent class.

P

Package declaration	A statement that uses the package keyword at the top of a Java source file to define a package.
Package	A namespace that groups related classes together.
Parameter	A variable passed into a method to provide input values.
Parent class	A class that is extended by another class in inheritance.
parseDouble method	A method that converts a string to a double.
parseInt method	A method that converts a string to an integer.
Polymorphism	The ability of an object to take multiple forms, allowing methods to be called on objects of different types.
Primitive data type	A basic data type in Java such as int, char, float, or Boolean.
Private access modifier	A modifier that restricts access to a class member so it can only be accessed within the same class.
Public access modifier	A modifier that allows a class, method, or variable to be accessible from anywhere in the application.

R

Random class	A class that is used to generate random numbers.
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Record	A compact class type introduced in Java 14 for immutable data storage.
Recursion	A programming technique where a method calls itself to solve a problem.
Reflection	The ability of a program to inspect and manipulate its own structure at runtime.
replace method	A method that replaces occurrences of a substring within a string.
replace	A method that replaces a character or substring with another value.
REST (Representational State Transfer)	A web service architecture that uses HTTP requests for communication.
return type	A data type of the value that a method returns.
Return type	The data type of the value returned by a function or method.
S	
Scanner class	A class that is used to take input from the user.
Scope	The accessibility of a variable or method within a program.
Serialization	The process of converting an object into a byte stream.
Single-line comment	A comment that starts that applies only to the text following it on that line.
Source file naming	A rule that states each public class should be in its own source file, named exactly after the class with a java extension.
split method	A method that splits a string into an array based on a given delimiter.
split	A method that divides a string into parts based on a delimiter.
Stack memory	A memory area used for storing method call frames and local variables.
StackOverflowError	An error that occurs when the call stack exceeds its limit due to deep or infinite recursion.
Static method	A method that belongs to a class rather than an instance and can be called without creating an object.
Static variable	A variable that belongs to a class rather than any specific instance.
static	A keyword used to define class-level methods and variables.
Stream	A sequence of elements supporting functional-style operations.

String	A sequence of characters, implemented as an immutable object in Java.
String literal	A way to create a string by enclosing text in double quotes.
StringIndexOutOfBoundsException	An unchecked exception that occurs when accessing an invalid index in a string.
substring method	A method that extracts a portion of a string based on the given indexes.
substring	A method that extracts a part of a string.
Super keyword	A keyword used to refer to the parent class of an object.
super keyword	A keyword that is used to refer to the parent class of the current object.
switch	A control structure that allows multiple execution paths.
Synchronized block	A block of code that ensures thread safety by allowing only one thread to execute at a time.
Synchronized block	A block of code that allows only one thread at a time to execute it, ensuring thread safety.
synchronized	A keyword ensuring that only one thread can access a block of code at a time.
System.out.println	A method that is used to print output to the console.
this keyword	A keyword that is used to reference the current instance of a class.
T	
this	A keyword that refers to the current object of a class.
Thread	A lightweight process that runs concurrently with other threads.
Thread	A lightweight process enabling concurrent execution.
throw keyword	A keyword that is used to manually raise an exception.
Throw keyword	A keyword used to explicitly throw an exception.
throws keyword	A keyword that is used in a method signature to declare that the method may throw exceptions.
throws	A declaration that a method may throw an exception.
toLowerCase	A method that converts all characters in a string to lowercase.
toUpperCase	A method that converts all characters in a string to uppercase.
trim	A method that removes whitespace from the beginning and end of a string.

try block	A block of code where exceptions are checked.
try-catch	A mechanism to handle exceptions gracefully using try and catch blocks.
Type casting	The process of converting one data type into another.
U	
unchecked exception	An exception that does not require explicit handling.
Unchecked exception	An exception that is not checked at compile-time and usually results from programming errors.
V	
var	A keyword introduced in Java 10 for local variable type inference.
Variable	A named storage location for data in a program.
void	A return type indicating a method does not return a value.
volatile	A keyword ensuring that a variable's value is always read from the main memory.
W	
while loop	A control structure that executes a block of code as long as a condition is true.
Wrapper class	A class that provides an object representation for primitive data types.



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