

Advanced Java Programming

Java (software platform)

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Java is a set of computer software and specifications that provides a software platform for developing application software and deploying it in a cross-platform computing environment. Java is used in a wide variety of computing platforms from embedded devices and mobile phones to enterprise servers and supercomputers. Java applets, which are less common than standalone Java applications, were commonly run in secure, sandboxed environments to provide many features of native applications through being embedded in HTML pages.

Writing in the Java programming language is the main way to produce code that will be deployed as byte code in a Java virtual machine (JVM); byte code compilers are also available for other languages, including Ada, JavaScript, Kotlin (Google's preferred Android language), Python, and Ruby. In addition, several languages have been designed to run natively on the JVM, including Clojure, Groovy, and Scala. Java syntax borrows heavily from C and C++, but object-oriented features are modeled after Smalltalk and Objective-C. Java eschews certain low-level constructs such as pointers and has a very simple memory model where objects are allocated on the heap (while some...

Java Platform, Micro Edition

A program created for the platform is called a MIDlet. The platform uses the object-oriented Java programming language, and is part of the Java software-platform

Java Platform, Micro Edition, often called simply Java ME or J2ME, is a computing platform for development and deployment of portable code for embedded and mobile devices (micro-controllers, sensors, gateways, mobile phones, personal digital assistants, TV set-top boxes, printers). A program created for the platform is called a MIDlet.

The platform uses the object-oriented Java programming language, and is part of the Java software-platform family. It was designed by Sun Microsystems (now Oracle Corporation) in 1999 under the name Java 2 Platform, Micro Edition. The earliest commercial Java ME software and supporting consumer hardware were released in 2001. MIDlets run inside a Java virtual machine understood by devices of various mobile manufacturers. This "write once, run anywhere" approach along with highly compressed file sizes made Java ME very popular for building simple mobile apps, most notably mobile games.

As of 2013, there were more than three billion Java ME-enabled mobile phones in the market, but the platform was in continued

decline by that time as feature phones had been overtaken by smartphones. Smartphones used dedicated hardware acceleration chips utilising APIs...

JavaScript

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JavaScript (JS) is a programming language and core technology of the Web, alongside HTML and CSS. Created by Brendan Eich in 1995, it is maintained by Ecma International's TC39 technical committee, with related Web APIs maintained by W3C and WHATWG. As of 2025, JavaScript is the most widely used programming language on GitHub. However, TypeScript, which is a version of JavaScript that is strict about types and is statically typed, overtook JavaScript on GitHub by August 2025.

Web browsers have a dedicated JavaScript engine that executes the client code. These engines are also utilized in some servers and a variety of apps. The most popular runtime system for non-browser usage is Node.js.

JavaScript is a high-level, often just-in-time-compiled language that conforms to the ECMAScript standard. It has dynamic typing, prototype-based object-orientation, and first-class functions. It is multi-paradigm, supporting event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).

The ECMAScript standard does not include any input/output...

Java Development Kit

Specification (JVMs) and provides the Standard Edition (SE) of the Java Application Programming Interface (API). It is derivative of the community driven OpenJDK

The Java Development Kit (JDK) is a software development kit for development of a Java platform application.

The JDK is designed to be mainly used to communicate with the Java Runtime Environment (JRE), but it can be replaced by other JDK-based languages which can communicate with the JRE and JVM. Furthermore, Java bytecode can be compiled statically directly into native code only with a JVM but without the necessity of the Java runtime environment running dynamically.

It implements the Java Language Specification (JLS) and the Java Virtual Machine Specification (JVMS) and provides the Standard Edition (SE) of the Java Application Programming Interface (API). It is derivative of the community driven OpenJDK which Oracle stewards. It provides software for working with Java applications. Examples of included software are the Java virtual machine, a compiler, performance monitoring tools, a debugger, and other utilities that Oracle considers useful for Java programmers.

Oracle releases the current version of the software under the Oracle

No-Fee Terms and Conditions (NFTC) license. Oracle releases binaries for the x86-64 architecture for Windows, macOS, and Linux based operating systems...

Java remote method invocation

The Java Remote Method Invocation (Java RMI) is a Java API that performs remote method invocation, the object-oriented equivalent of remote procedure calls

The Java Remote Method Invocation (Java RMI) is a Java API that performs remote method invocation, the object-oriented equivalent of remote procedure calls (RPC), with support for direct transfer of serialized Java classes and distributed garbage-collection.

The original implementation depends on Java Virtual Machine (JVM) class-representation mechanisms and it thus only supports making calls from one JVM to another. The protocol underlying this Java-only implementation is known as Java Remote Method Protocol (JRMP). In order to support code running in a non-JVM context, programmers later developed a CORBA version.

Usage of the term RMI may denote solely the programming interface or may signify both the API and JRMP, IIOP, or another implementation, whereas the term RMI-IIOP (read: RMI over IIOP) specifically denotes the RMI interface delegating most of the functionality to the supporting CORBA implementation.

The basic idea of Java RMI, the distributed garbage-collection (DGC) protocol, and much of the architecture underlying the original Sun implementation, come from the "network objects" feature of Modula-3.

== Generalized code ==

The programmers of the original RMI API generalized...

Comparison of Java and C++

Java and C++ are two prominent object-oriented programming languages. By many language popularity metrics, the two languages have dominated object-oriented

Java and C++ are two prominent object-oriented programming languages. By many language popularity metrics, the two languages have dominated object-oriented and high-performance software development for much of the 21st century, and are often directly compared and contrasted. Java's syntax was based on C/C++.

== Design aims ==

The differences between the programming languages C++ and Java can be traced to their heritage, as they have different design goals.

C++ was designed for systems and applications programming (i.e., infrastructure programming), extending the procedural programming language C, which was designed for efficient execution. To C, C++ added support for object-oriented programming, exception handling, lifetime-based resource management (Resource Acquisition Is Initialization (RAII)), generic

programming, template metaprogramming, and the C++ Standard Library which includes generic containers and algorithms (the Standard Template Library or STL), and many other general purpose facilities.

Java is a general-purpose, concurrent, class-based, object-oriented programming language that is designed to minimize implementation dependencies. It relies on a Java virtual machine to...

Oracle Certification Program

candidate's knowledge of the Java programming language and is a prerequisite to being an Oracle Certified Programmer. While most advanced certifications focus

The Oracle Certification Program certifies candidates on skills and knowledge related to Oracle products and technologies.

Credentials are granted based on a combination of passing exams, training and performance-based assignments, depending on the level of certification. Oracle certifications are tangible benchmarks of experience and expertise that Oracle claims to help a participant stand out in a crowd among employers.

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The Oracle Certified Junior Associate (OCA) credential is a novice-level certification focused on students in secondary schools, two-year colleges and four year colleges and universities and faculty members who teach foundational Java and computer science classes.

The Oracle Certified Associate (OCA...

Java version history

Babylon aims to extend the Java language's reach to alternative programming models with an enhancement to its reflective programming abilities, called code

The Java language has undergone several changes since JDK 1.0 as well as numerous additions of classes and packages to the standard library. Since J2SE 1.4, the evolution of the Java language has been governed by the Java Community Process (JCP), which uses Java Specification Requests (JSRs) to propose and specify additions and changes to the Java platform. The language is specified by the Java Language Specification (JLS); changes to the JLS are managed under JSR 901. In September 2017, Mark Reinhold, chief architect of the Java Platform, proposed to change the release train to "one feature release every six months" rather than the then-current two-year schedule. This proposal took effect for all following versions, and is still the current release schedule.

In addition to the language changes, other changes have been made to the Java Class Library over the years, which has grown from a few hundred classes in JDK 1.0 to over three thousand in J2SE 5. Entire new APIs, such as Swing and Java2D, have been introduced, and many of the original JDK 1.0 classes and methods have been deprecated, and very few APIs have been removed (at least one, for threading, in Java 22). Some programs allow...

List of Java APIs

There are two types of Java programming language application programming interfaces (APIs): The official core Java API, contained in the Android (Google)

There are two types of Java programming language application programming interfaces (APIs):

The official core Java API, contained in the Android (Google), SE (OpenJDK and Oracle), MicroEJ. These packages (java.* packages) are the core Java language packages, meaning that programmers using the Java language had to use them in order to make any worthwhile use of the Java language.

Optional APIs that can be downloaded separately. The specification of these APIs are defined according to many different organizations in the world (Alljoyn, OSGi, Eclipse, JCP, E-S-R, etc.).

The following is a partial list of application programming interfaces (APIs) for Java.

Comparison of C Sharp and Java

This article compares two programming languages: C# with Java. While the focus of this article is mainly the languages and their features, such a comparison

This article compares two programming languages: C# with Java. While the focus of this article is mainly the languages and their features, such a comparison will necessarily also consider some features of platforms and libraries.

C# and Java are similar languages that are typed statically, strongly, and manifestly. Both are object-oriented, and designed with semi-interpretation or runtime just-in-time compilation, and both are curly brace languages, like C and C++.

== Types ==

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