Java

## Java SDK (Software Development Kit)

The Java SDK is a comprehensive set of tools for developing Java applications. It is also known as the Java Development Kit (JDK).

The Java SDK includes:

* **Java Compiler (`javac`)** - converts Java source code into bytecode. This is the Java equivalent of Microsoft's Common Intermediate Language and is simply known as "Java bytecode". Java bytecode files typically have a `.class` extension.

The Java compiler is called `javac` - and this is the command to call from the CLI when invoking the compiler.

* **Java Runtime Environment (JRE)** - allows you to run Java applications. It includes the Java Virtual Machine (JVM), core classes, and supporting files.

The Java Virtual Machine interprets and compiles Java bytecode for execution.

* **Java Standard Library (Java API)** - a set of standard libraries that provide a wide range of functionalities.
* **Development Tools** - tools like debuggers, profilers and documentation generators.

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|  | Java | C# |
| Software Development Framework | Java SDK (Software Development Kit) | .NET SDK (previously .NET Core) |
| Runtime Environment | Java Runtime Environment (Java Virtual Machine and Core Libraries) | Common Language Runtime (CLR) within the .NET Runtime |
| Intermediate Language | Java Bytecode | Common Intermediate Language (CIL) |

# JavaFX

JavaFX is a framework (or toolkit) that provides a structured way to build applications with graphical user interfaces (GUIs). JavaFX includes a wide range of APIs and libraries for developing GUIs. These include components for building user interfaces, handling user input, rendering graphics, playing media and more.

### JavaFX SDK

The JavaFX SDK is the development kit that includes the JavaFX libraries, runtime, tools and documentation.

**Libraries**

The JavaFX libraries are a collection of classes and methods for building GUI components, handling events, rendering graphics, playing media, and more.

**Runtime**

The JavaFX runtime refers to additional Java runtime components needed to run JavaFX applications. To be more specific, this refers to libraries that extend the capabilities of the core Java runtime by adding specialised functionalities for GUI development and multimedia.

### FXML

JavaFX uses FXML, an XML-based user interface markup language created by Oracle for defining the user interfaces of JavaFX applications.