

Aspect	JVM (Java Virtual Machine)	JDK (Java Development Kit)	Environment
Purpose	Executes Java bytecode	Provides tools to develop and compile Java programs	Provides environment to run Java programs
Components	Consists of the interpreter, JIT compiler, and Garbage Collector	Includes JRE, compiler (javac), and debugging tools	Includes JVM and core libraries
Role in Java	Runs Java applications by converting bytecode into machine code	Used by developers for writing, compiling, and debugging Java code	Used to run compiled Java programs (bytecode)
Tools	No development tools	Includes tools like javac, javadoc, javap	No development tools
Target Users	Required to run Java applications	Required by developers for developing Java applications	Required by users running Java applications
Contains	Part of JRE	Contains JRE and development tools	Contains JVM and standard libraries
Installation Requirement	Installed when Java programs need to be run	Installed by developers to write, compile, and debug Java code	Installed to run Java applications
Usage	Interprets or compiles bytecode into machine code at runtime	Used for compiling and developing Java applications	Used for executing Java applications
Example Command	java	↓ javac (for compiling), java (for running)	java (for running applications)