Difference between JDK, JRE, and JVM

1. JDK

Java Development Kit aka JDK is the core component of Java Environment and provides all the tools, executables, and binaries required to compile, debug, and execute a Java Program.

JDK is a platform-specific software and that’s why we have separate installers for Windows, Mac, and Unix systems.

We can say that JDK is the superset of JRE since it contains JRE with Java compiler, debugger, and core classes.

1. JVM

Java Virtual Machine , is responsible for converting the byte code(compiled code) to the machine-specific code.

JVM provides core java functions such as memory management, garbage collection, security, etc. JVM is customizable and we can use java options to customize it. For example, allocating minimum and maximum memory to JVM.

1. JRE (Java Run Time Environment )

JRE is the implementation of JVM(this is virtual and does not exist physically , so this is its implementation ).

It provides a platform to execute java programs. JRE consists of JVM, Java binaries, and other classes (rt.jar have access to core classes e.g. java.lang.String, java.lang.Thread, java.util.ArrayList etc , In windows, rt.jar will always reside under $JAVA\_HOME/jre/lib ) to execute any program successfully.

JRE doesn’t contain any development tools such as Java compiler, debugger, JShell, etc. If you just want to execute a java program, you can install only JRE. You don’t need JDK because there is no development or compilation of java source code is required.



