# JVM

By

Dr M. Senthilkumar

# Developer

- ✓ Receives a Problem from Customer
- ✓ Understands the Problem
- ✓ Define the Problem
- ✓ Finds the Solution
- ✓ Writes an Algorithm using English like words
- ✓ Chooses Hardware and Software Tools to Implement
- ✓ Understands Unicode Character Set
- ✓ Understands Java Tokens
- ✓ Develop Statements
- ✓ Constructs Source Code

# Java Compiler

- ✓ javac Receives Source Code
- ✓ Check for Syntactical Errors
- ✓ Generates Intermediate Code
- ✓ Intermediate Code is called as Byte Code
- ✓ Byte Code is .class file
- ✓ Byte Code is not a Machine Readable Code
- ✓ Byte Code is Common for all Machines
- ✓ Byte Code is Portable
- ✓ Byte Code can be understood by JVM
- ✓ Byte Code is also known as Virtual Machine Code

# JVM

- ✓ Java Virtual Machine
- ✓ Not a Real Machine
- ✓ Simulated Computer within a Computer
- ✓ Resides within Computer Memory
- ✓ Receives Byte Code from javac
- ✓ Reads, Understands and Analyze the Byte Code
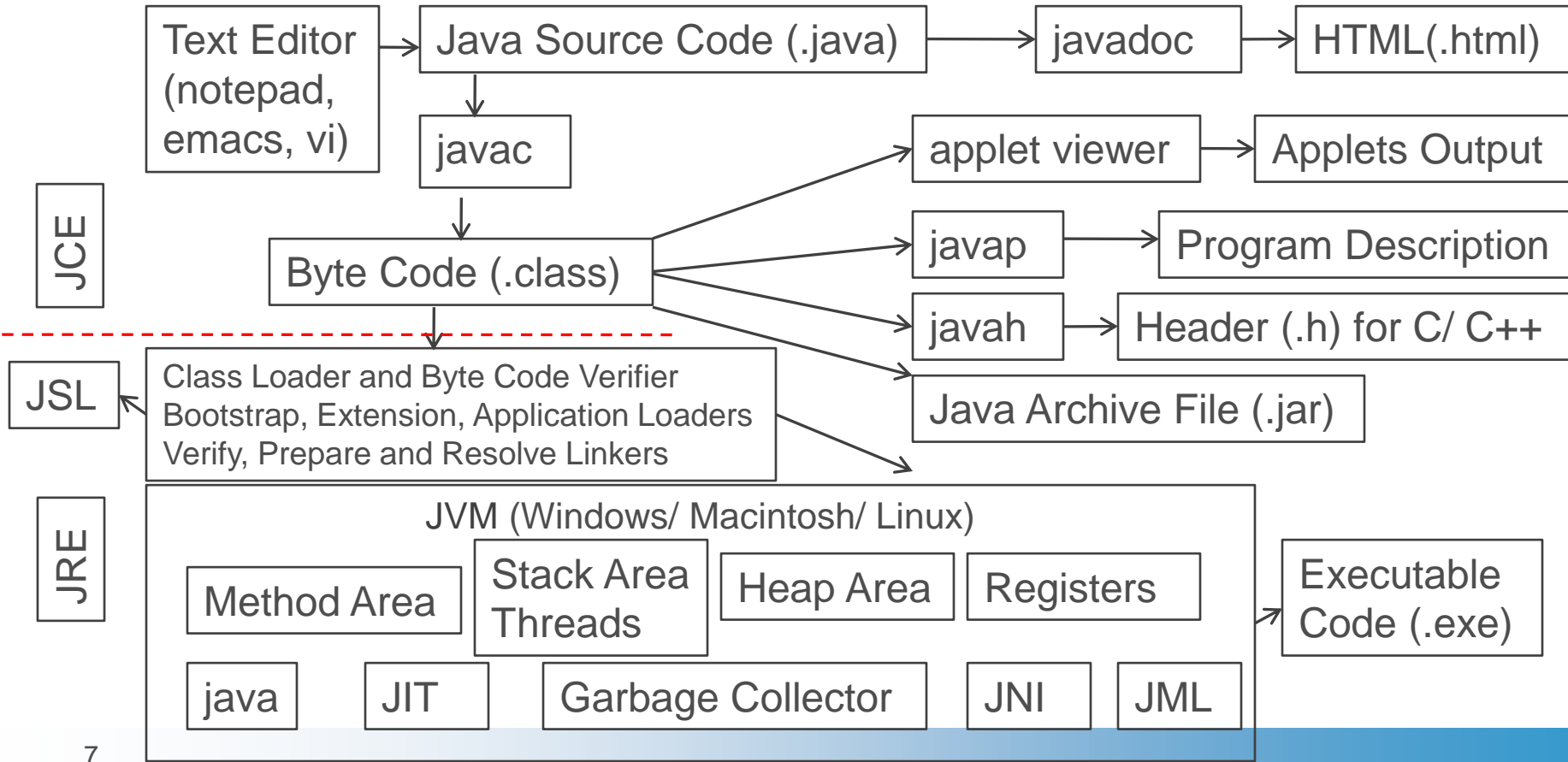- ✓ Transfers Bytes Code to java

# Java Interpreter

- ✓ Name of the Interpreter is java
- ✓ Receives Byte Code from JVM
- ✓ Reads, Understands and Analyze the Byte Code
- ✓ Transfers Bytes Code to Machine Executable Code
- ✓ Machine Executable Code is a .exe file
- ✓ Machine Executable Code is Executed by the Real Machine

# JIT

- ✓ Just-In Time Compiler (Intermediate Code Generator)
- ✓ Requires Less Memory
- ✓ Optimizes Byte Code (More Readable Code) in Running
- ✓ Converts Byte Code to the Native Machine Code
- ✓ Sends directly to CPU
- ✓ Increases the Performance of Execution
- ✓ Data analysis
- ✓ Translation from stack operations to register operations
- ✓ Eliminates sub expressions
- ✓ Don't go for small program/ May increase Complexity

# Building and Running a Java Program

Text Editor (notepad, emacs, vi) → Java Source Code (.java) → javadoc → HTML(.html)

Java Source Code (.java) → javac → Byte Code (.class)

JCE

Byte Code (.class) → applet viewer → Applets Output

Byte Code (.class) → javap → Program Description

Byte Code (.class) → javah → Header (.h) for C/ C++

Byte Code (.class) → Java Archive File (.jar)

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

JSL

Class Loader and Byte Code Verifier
Bootstrap, Extension, Application Loaders
Verify, Prepare and Resolve Linkers

JRE

JVM (Windows/ Macintosh/ Linux)

Method Area     Stack Area Threads     Heap Area     Registers

java     JIT     Garbage Collector     JNI     JML

Executable Code (.exe)

# Thank you