Lesson 1: Introduction to Java And the Eclipse Development Environment

Pulling the Arrow Back to Hit the Target

Wholeness of the Lesson

- Java is an object-oriented highly portable programming language that arose as an easy alternative to the once dominant, but error-prone, C++ language. Eclipse is one of many open source, powerful but easy-to-use integrated development environments for use with Java and related technologies. *Transcendental meditation is a highly portable and powerful technique working from deeper levels of intelligence allows one to accomplish more with less effort.*

Outline of Topics

- About Java
- Java 16 API Docs
- Java First Program
- Working with IDE
- Working with JShell
- Viewing Java API Source Code

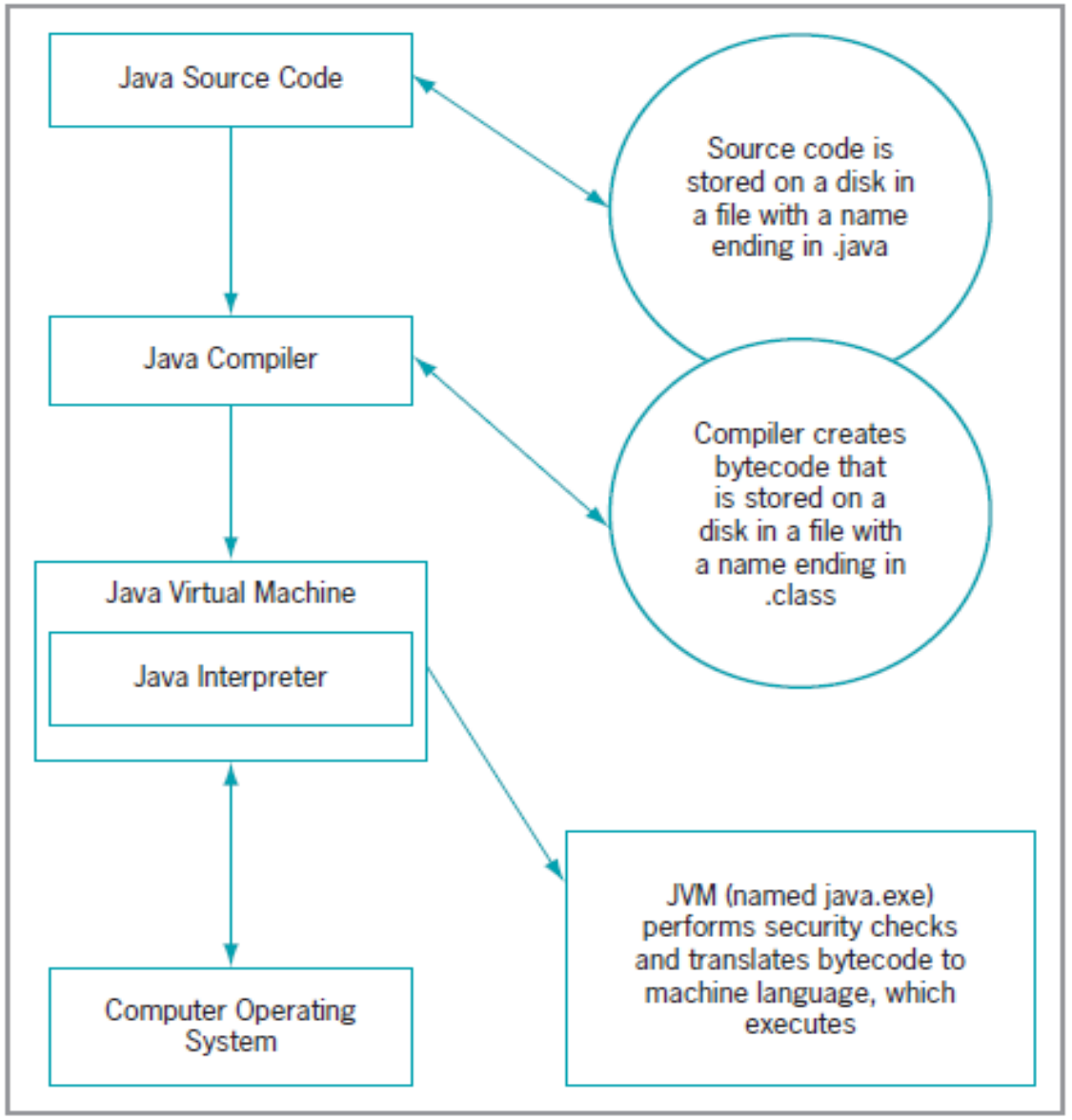
About Java

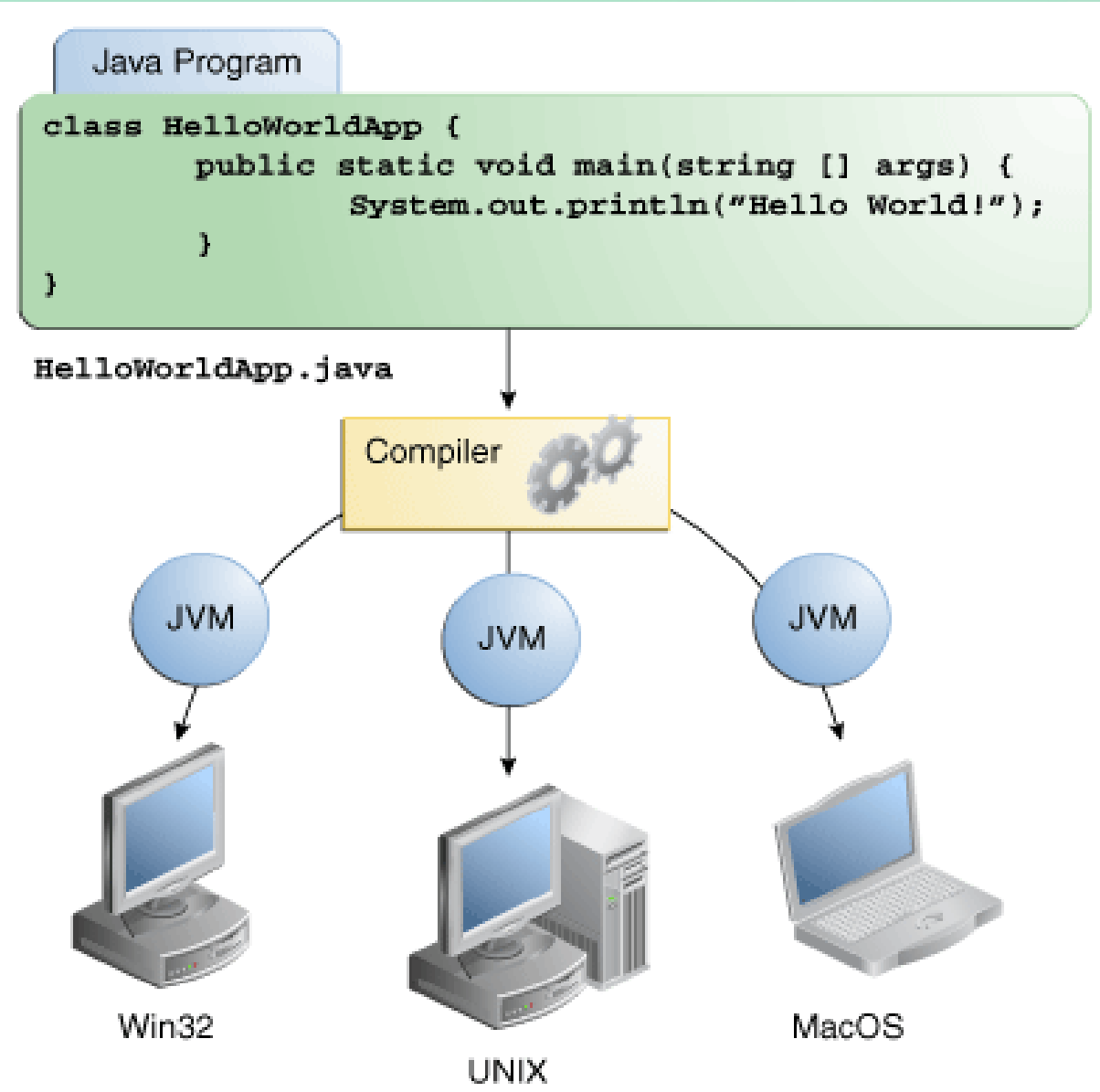
- ***Brief History.*** The Java language began as a language for programming electronic devices, though the original project was never completed. Its creator was James Gosling, of Sun Microsystems. The language was developed privately starting in 1991, and was made publicly available in 1994. In 2009, Oracle bought the rights to Java from Sun Microsystems.
- ***Java Is an OOP Language.*** Java is an object-oriented programming language. This means that Java programs are designed by defining software objects that interact with each other (mirroring the way things get done in the real world).

About Java

- ***Number 1 Language.*** For more than 20 years, Java has been the Number 1 programming language in the IT world.
- ***Interpreted Language.*** When you "compile" Java code, the result is not executable binary code, targeted to a particular machine; instead, the result is **bytecode**, having a portable intermediate code format. The bytecode is then executed by running an **interpreter,** called the **Java Virtual Machine** (JVM). This approach makes Java code highly portable; Java will run on any platform for which a JVM has been created.

Java Environment





The Java API Docs

- Oracle provides online documentation of all the Java library classes. Full documentation of each class in the Java libraries is provided. For Java 16, the link is

https://docs.oracle.com/en/java/javase/16/docs/api/index.html

First Program

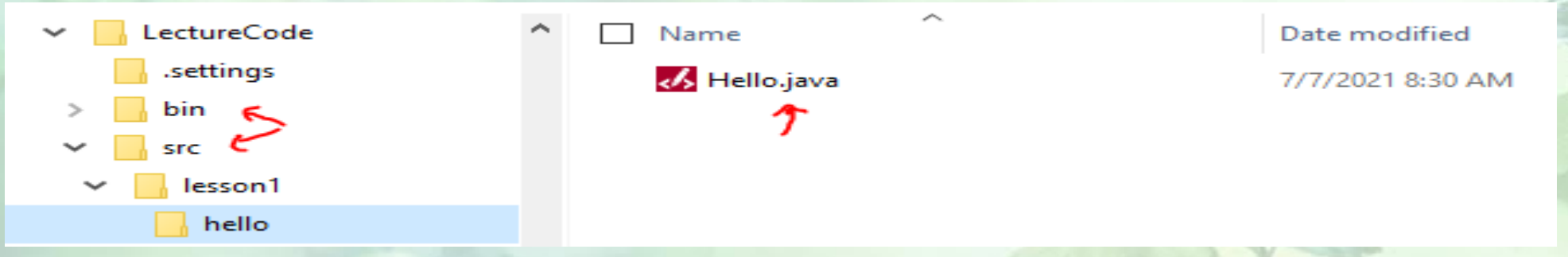
```
public class HelloWorld {
public static void main(String[] args) {
System.out.println("Hello World");
}
}
```

Introducing Java Things to understand:

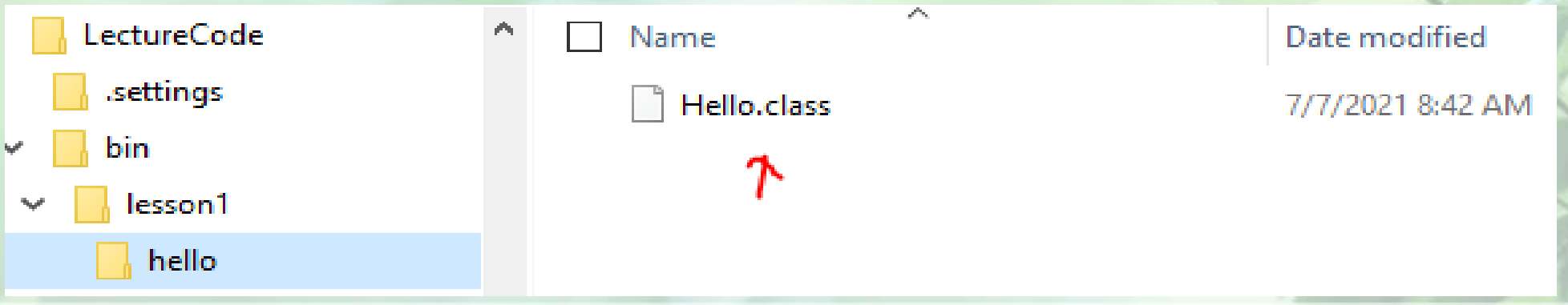
- public
- class
- static
- void
- main
- String[]
- System, System.out, System.out.println (vs System.out.print)
  - out is an object of java.io.PrintStream
- delimiters: ;, }, { (“blocks”)
- capitalization conventions

"Hello World" – the class file

When you create an Eclipse project, Eclipse creates a src folder (which will contain your source code) and a bin folder (which will contain the compiled files – the .class files).



The .class file is an intermediate file consisting of *bytecode.* The bytecode is interpreted by the operating system into native code at runtime.



Quiz

public static void main(String[] a) { }. This statement is _____

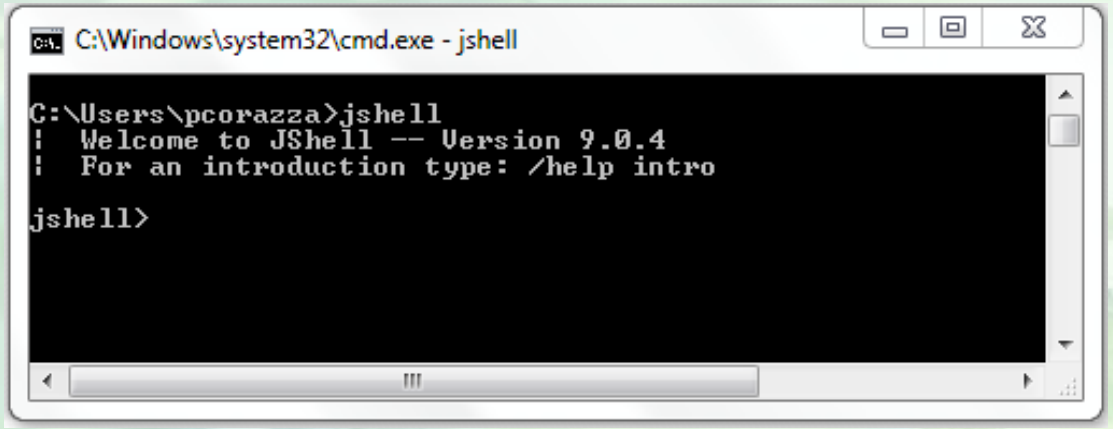
a. True b. False

Byte code is Platform dependent.

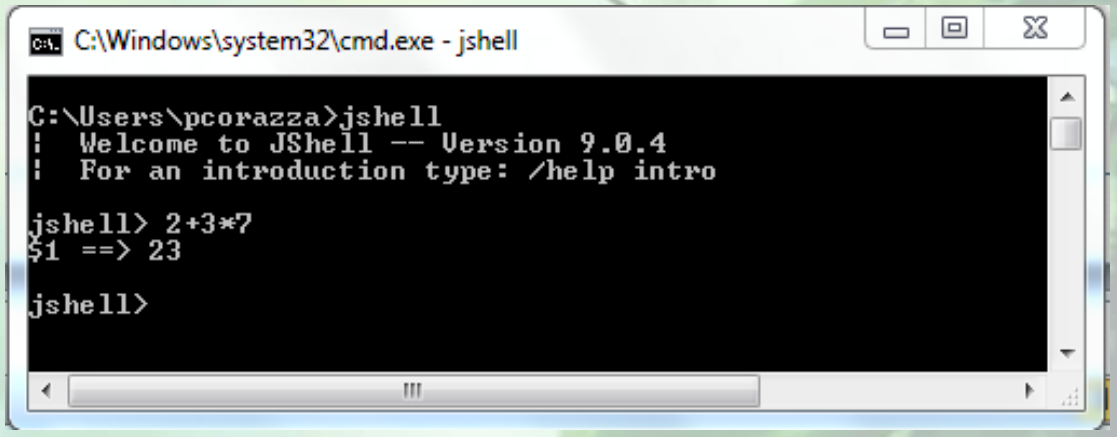
a. True b. False

Trying Out Code with JShell

- JShell is a Java 9 feature that lets you try out code interactively at the command line.
- To start JShell, type jshell at the command line(windows).
- Mac users press command + space then type Terminal.app. Type jshell to start.

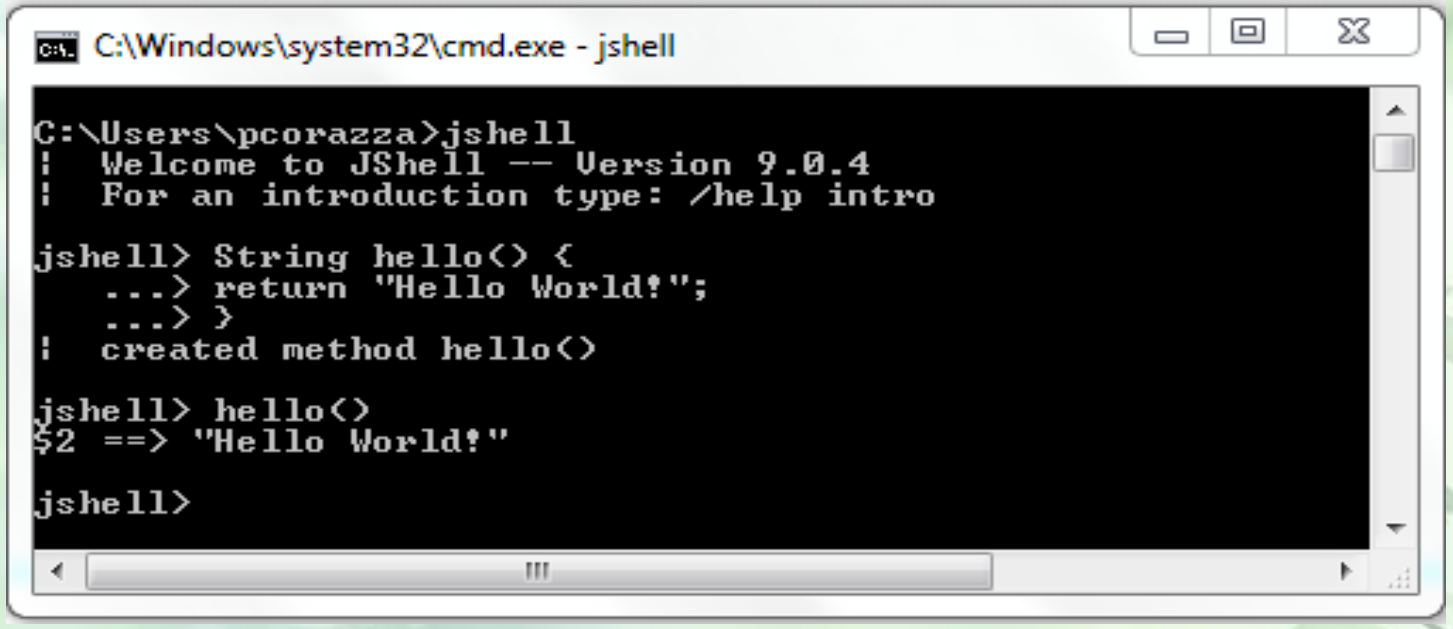


- You can use JShell to evaluate expressions



(continued)

- You can define a Java method in JShell and then run it



- Exit JShell by typing /exit at the JShell prompt
- To know more about JShell https://docs.oracle.com/javase/9/jshell/introduction-jshell.htm#JSHEL-GUID-630F27C8-1195-4989-9F6B-2C51D46F52C8
- **Refer:** Resources/LecturePPT/Lesson1/Setting Java Path Step by Step.pdf, if Jshell does not work you have to setup path to add the bin directory to execute from the command prompt.

Main Point 1

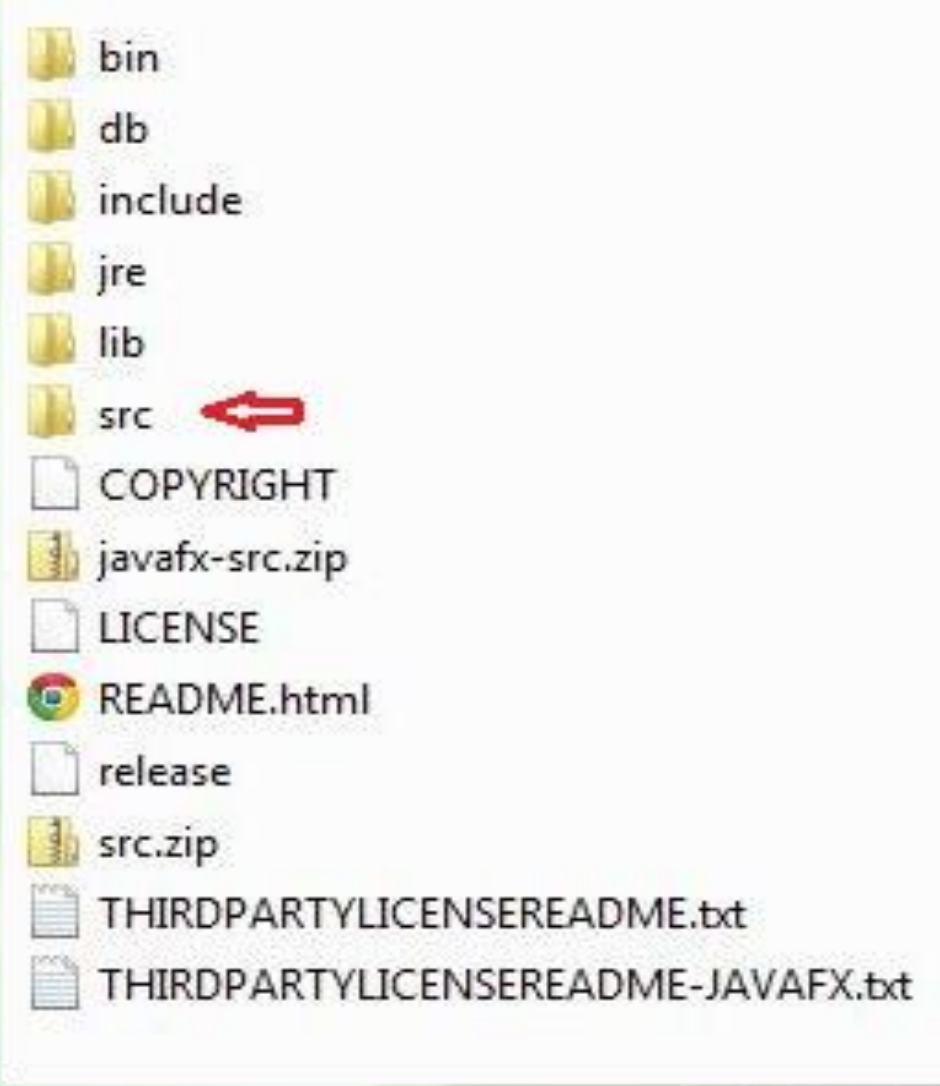
- Java is an object-oriented language that is easier to use, similar to C++, but simplified to eliminate language features that cause common programming errors.
- *Science of Consciousness* :Transcendental Meditation is an easy and effortless technique to make a mind clear and more alert so that we can achieve anything in our life without error.

Integrated Development Environments

- A good IDE supports compiling, running, and debugging code with tools that are integrated and typically easy to use. For a large Java project, an IDE is indispensable.
- Good choices of IDE are NetBeans, Sun Forte, IBM Rational Application Developer (formerly WebSphere Application Developer), Borland's JBuilder, JetBrains' IntelliJ
- Another excellent choice, which has become an industry standard, is the open-source IDE Eclipse, written entirely in Java. Among IDEs for Java, in recent years, Eclipse is the most widely used. We will use Eclipse in this course.
  - Install JDK
  - Install Eclipse IDE

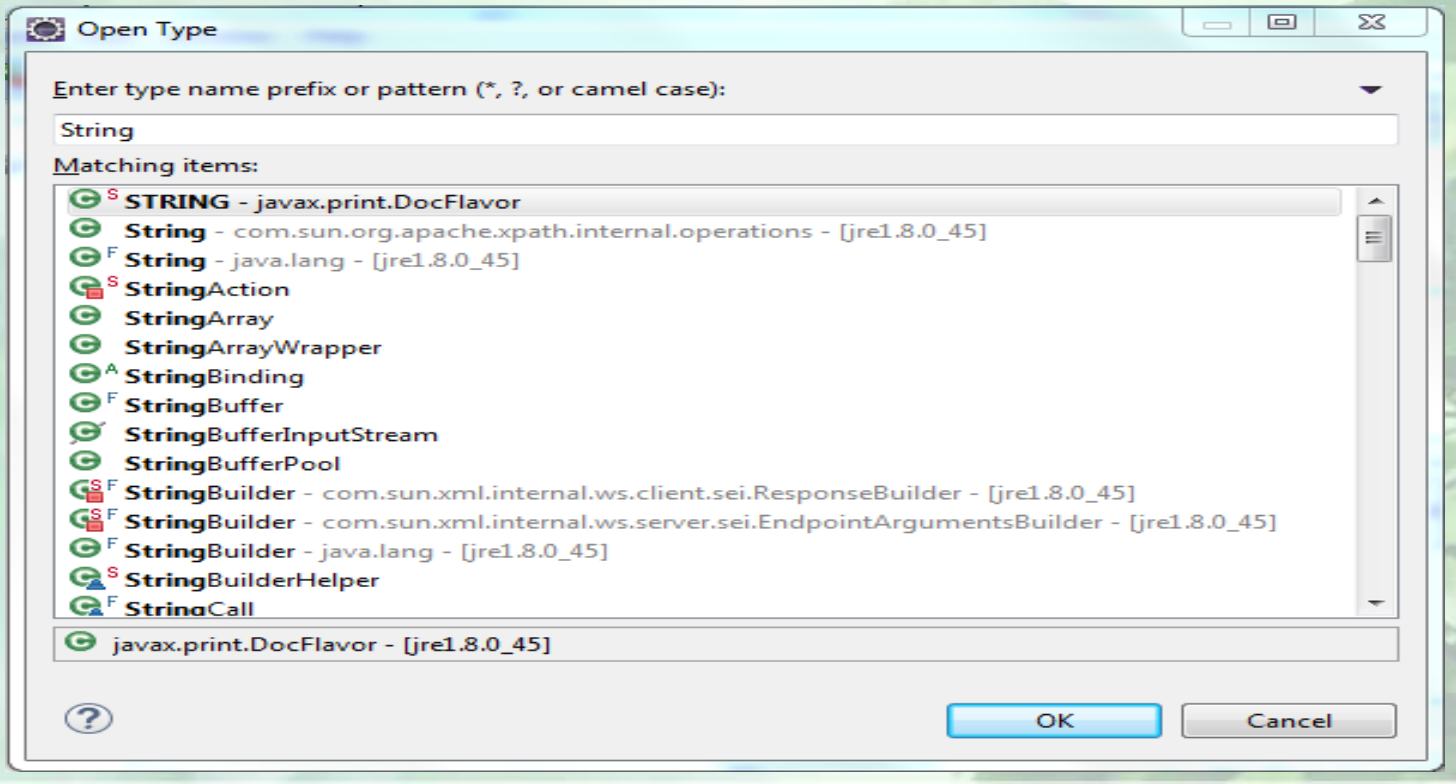
The JDK Distribution & Viewing Source Code

- It's a good idea to unzip src.zip and place in a source folder (called “src” in the screen capture above) – this will allow you to see how Oracle has implemented its library classes. You can also unzip javafx-src.zip to look at JavaFX source code.

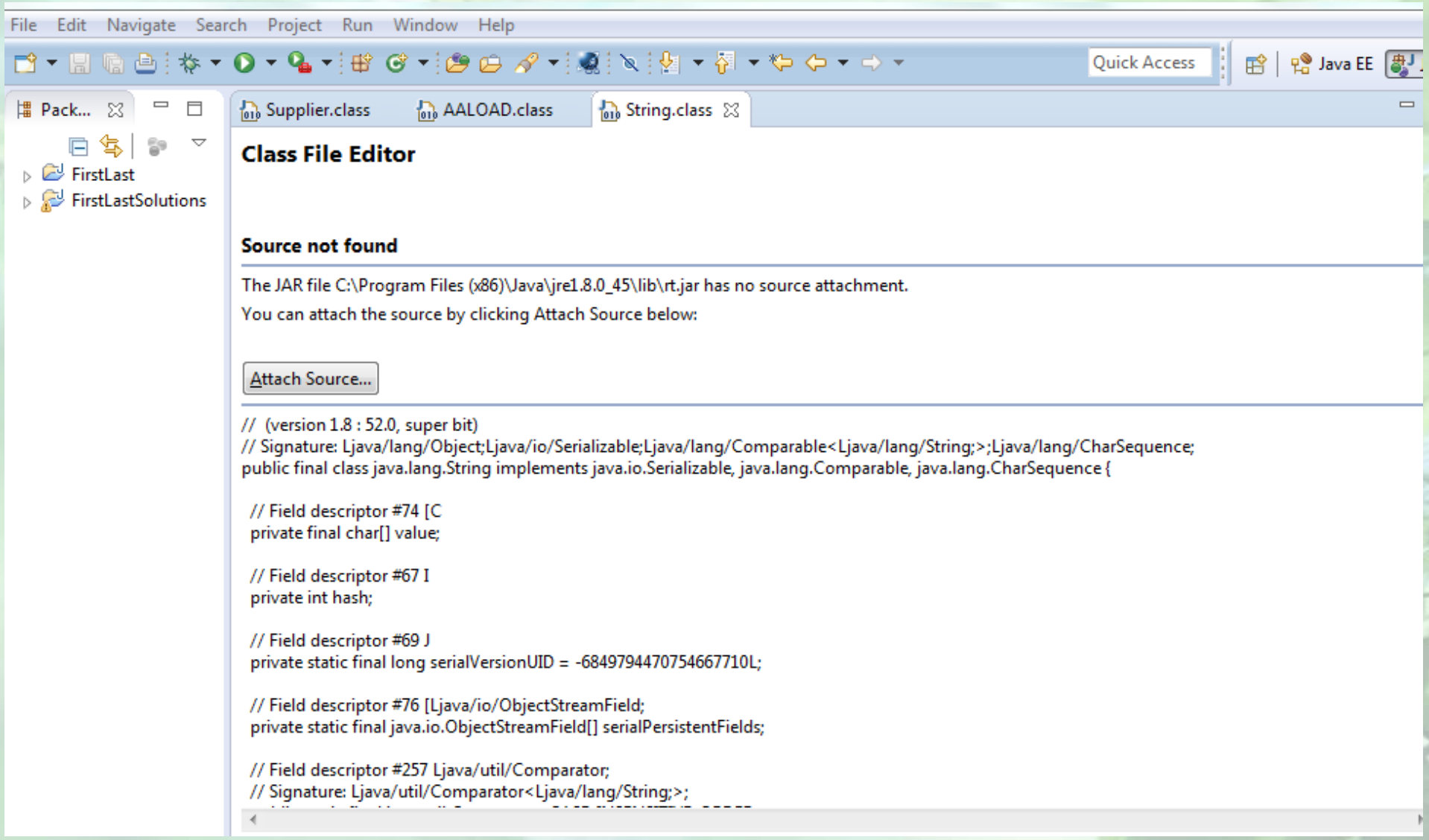


View of Attaching Java Source Code from API

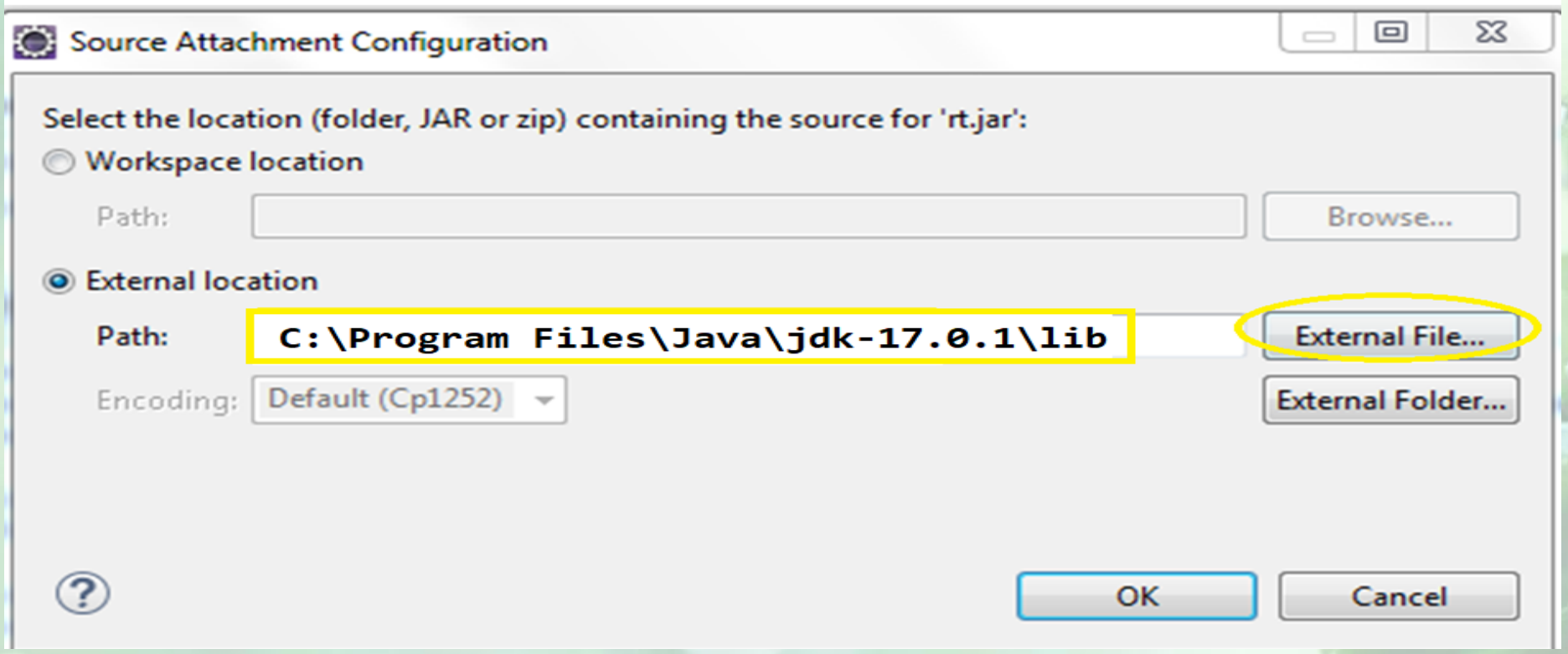
- Allows you to see how Java has implemented their library code.
- Steps:
  1. Ctrl – Shift – T
     - Brings up this screen: (Here, "String" was typed into search window")
     - Click OK.



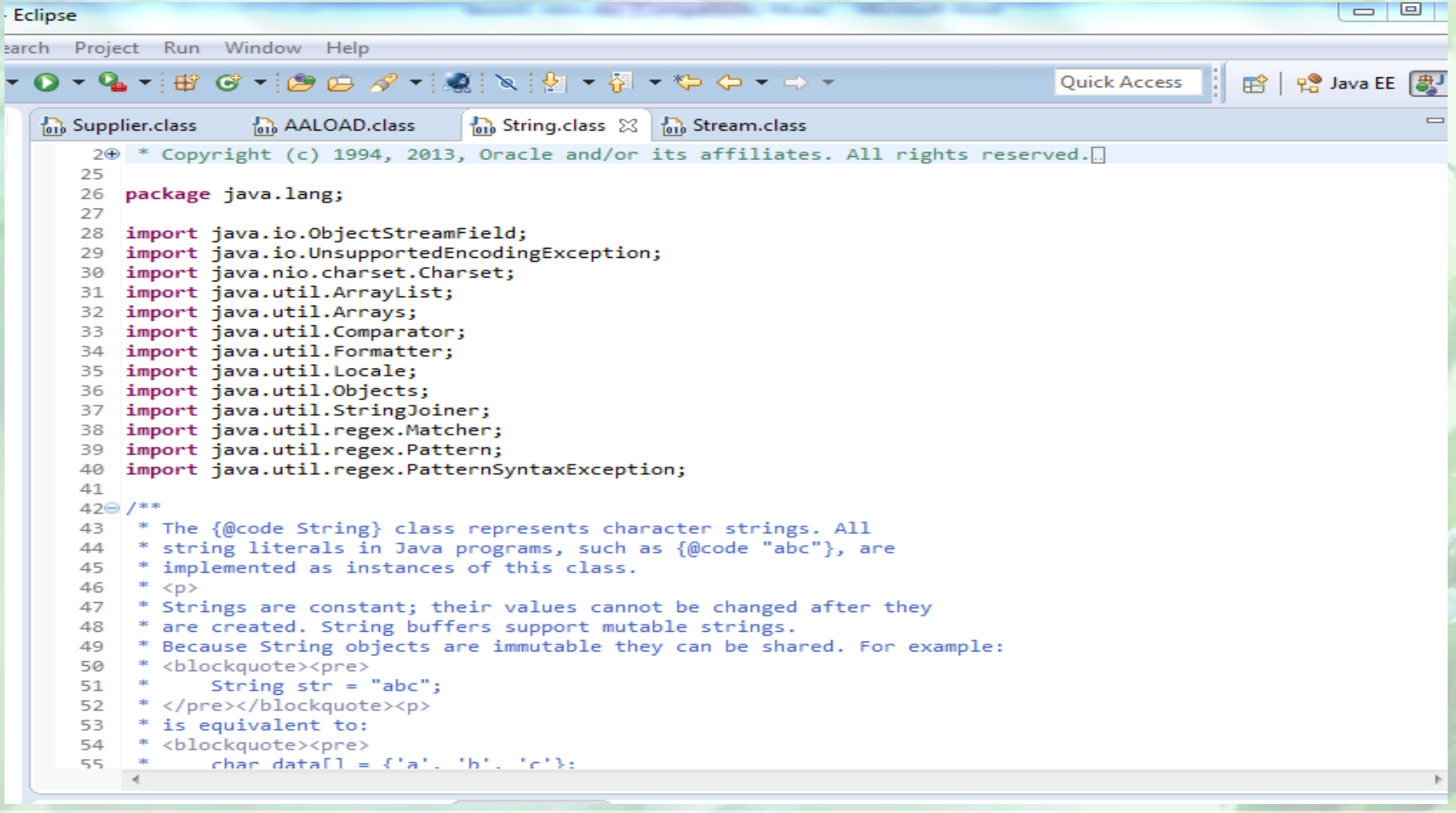
2. After Clicking OK from previous screen lets you see incomplete info of the class file (of String in this case), Click Attach Source



3. After Clicking Attach Source and navigate to src.zip in your jdk distribution (do only once – next time just do steps A and B) by clicking External File. **src.zip is available in lib directory. Example C:\Program Files\Java\jdk-17.0.1\lib. Depends where Java folder resides on your PC and jdk version you installed.**



4. You can now see the source code for your selected type



MAIN POINT 2

- Eclipse is a leading, open-source, 100% Java, integrated development environment, which provides excellent support for editing, compiling, running, and debugging Java applications. *By analogy, to create a good life, we need to handle inner life and at the same time, structure a life-supporting environment – the goal is to live 200% of life.*

UNITY CHART

CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

The Usefulness of Java and Eclipse IDE

- Using Java, highly functional applications can be built more quickly and easily with fewer mistakes than is typically possible using C or C++.
- To optimize the use of Java's features, IDE's such as Eclipse ease the work of the developer by handling in the background many routine tasks.

- ***Transcendental Consciousness*** is the source from the field of pure intelligence which is the basis for successful action.
- ***Impulses within the Transcendental Field :*** *At this level of experience, consciousness acting within itself to produce the desired outcome.*
- ***Wholeness moving within Itself****: In Unity Consciousness, the pure intelligence located in TC is found pervading all of creation, from gross to subtle.*