**Assignment 1 Java**

1.

 Java was initially developed for consumer electronics but later adapted for web development.

It's a platform-independent language, meaning it can run on different operating systems.

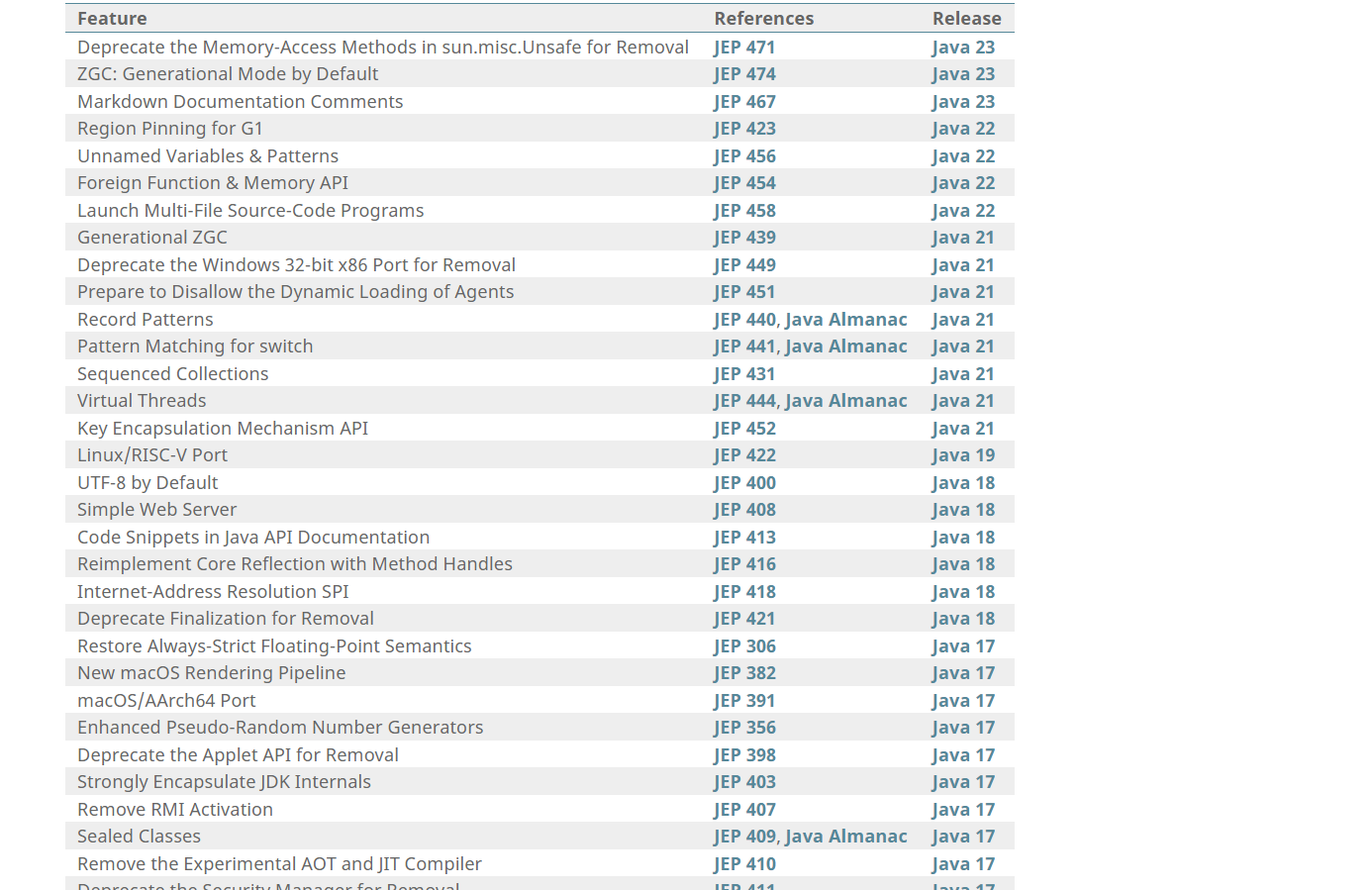
Java is known for its object-oriented programming paradigm, which helps create modular and reusable code.

 It's widely used for building web applications, Android apps, and server-side software.

 Sun Microsystems (now owned by Oracle) is the primary company behind Java.

Java's popularity is due to its reliability, security, and ease of use.

2.



3.

According to the class requirement I am going to use java 8 or above version

Currently in my windows 11 system I have installed java 21

4.

* **bin**: This folder stores executable files for all the development tools you'll need, like javac (Java compiler) and java (Java runtime).
* **lib**: This folder contains essential files used by the development tools, including core libraries like tools.jar and dt.jar.
* **jre**: This directory holds the Java Runtime Environment (JRE) that's used by the JDK development tools. JRE is what allows you to run Java programs.
* **src.zip**: This archive contains the source code for the Java platform, useful for advanced users who want to delve into the inner workings of Java.
* **include**: This folder stores C-language header files that provide support for native code programming with various libraries. These are helpful for situations where you need to interact with code written in C or C++.

5.

**Important points about Java technology and its components:**

* **Java as a Programming Language:**
  + High-level, simple, object-oriented
  + Designed for distributed applications
  + Supports multithreading for concurrent execution
  + Secure and robust
* **Java as a Platform:**
  + Software-only platform, runs on top of existing hardware platforms
  + Two main components:
    - Java Virtual Machine (JVM): Executes bytecode instructions, provides platform independence.
    - Java Application Programming Interface (API): Provides pre-written software components for various functionalities.

7.

* The JVM is a program that executes bytecode instructions, providing platform independence for Java applications.
* It has three main subsystems:
  + Class Loader: Loads, links, and initializes class files.
  + Runtime Data Area: Stores data for the JVM, including:
    - Method Area: Holds loaded class information.
    - Heap Area: Stores object instances during program execution.
    - Stack Area: Manages method calls and local variables.
    - PC Registers: Keep track of the program counter (instruction pointer).
  + Execution Engine: Executes bytecode instructions by interpreting them or compiling them to native code for the underlying operating system.

8.

**Java is object-oriented:** Programs are built around objects that encapsulate data and behaviour.

**Architecture neutral:** Java code can run on any platform that has a Java Virtual Machine (JVM).

**Portable:** Once written, Java code can run on any system with a JVM.

**Robust:** Java has features that help prevent errors and crashes.

**Interpreted:** Java bytecode is translated into machine code at runtime by the JVM.

**Dynamic:** Java programs can load and execute code at runtime.

6.

