**1. What is Java?**

Java is a programming language created by Sun Microsystems (now owned by Oracle). It is used to build applications for computers, phones, and websites. Java is known for being easy to learn, secure, and able to run on any device.

**Key Features of Java:**

* **Simple**: Java is easy to write and understand.
* **Object-Oriented**: Everything in Java is based on objects, making it organized and reusable.
* **Platform-Independent**: Java programs can run on any device (Windows, Mac, Linux, etc.) without changes.
* **Secure**: Java has built-in safety features to protect against viruses.
* **Fast**: Java uses a special tool (JIT) to make programs run quickly.
* **Multithreading**: Java can do many tasks at the same time.

**2. What are JVM, JRE, and JDK?**

* **JVM (Java Virtual Machine)**: It is a program that runs Java code. It makes Java programs work on any device.
* **JRE (Java Runtime Environment)**: It includes the JVM and other tools needed to run Java programs. Users need this to run Java apps.
* **JDK (Java Development Kit)**: It is a toolkit for developers. It includes the JRE, a compiler (to turn code into a program), and other tools for writing Java programs.

**Simple Relationship:**

* **JDK** is for developers to create programs.
* **JRE** is for users to run programs.
* **JVM** is the engine that runs the program.

**3. What is Bytecode?**

Bytecode is a special code that Java creates when you compile your program. It is not for humans to read but for the JVM to understand. Bytecode makes Java programs work on any device.

**Procedural vs Object-Oriented Programming:**

* **Procedural Programming**: Focuses on steps or procedures. Example: C language.
* **Object-Oriented Programming (OOP)**: Focuses on objects (like real-world things). Example: Java.

**Key Differences:**

* **Procedural**: Data and functions are separate.
* **OOP**: Data and functions are combined into objects.
* **OOP** is more organized and reusable.

**4. History of Java**

* **1991**: Java started as a project called "Oak" for small devices.
* **1995**: It was renamed "Java" and released to the public.
* **1996**: The first version of Java (JDK 1.0) was released.
* **2010**: Oracle bought Sun Microsystems and took over Java.
* **2021**: Java 17 was released, which is a stable and long-term version.

Java was first made for small devices but became popular for websites and apps.

**5. Applet vs Application**

* **Applet**: A small Java program that runs inside a web browser. Example: A game on a website.
* **Application**: A standalone Java program that runs on your computer. Example: A calculator app.

**Key Differences:**

* **Applet**: Runs in a browser, has limited access to your computer.
* **Application**: Runs directly on your computer, has full access to your system.
* **Applets** are not used much today because modern browsers no longer support them.

What is Java? Java is a programming language developed by Sun Microsystems, which is now part of Oracle. It is widely used for creating applications across computers, mobile devices, and websites. Java is appreciated for its ease of learning, security features, and compatibility with various devices. Key Features of Java: Simple: Java is straightforward to write and comprehend. Object-Oriented: Java is built around objects, promoting organization and reusability. Platform-Independent: Java applications can run on any operating system (Windows, Mac, Linux, etc.) without modification. Secure: Java incorporates built-in safety measures to guard against malware. Fast: Java employs a Just-In-Time (JIT) compiler to enhance program execution speed. Multithreading: Java supports concurrent execution of multiple tasks. What are JVM, JRE, and JDK? JVM (Java Virtual Machine): This is a program that executes Java code, enabling Java applications to function on any device. JRE (Java Runtime Environment): This encompasses the JVM along with other necessary tools to run Java applications. Users require this to execute Java programs. JDK (Java Development Kit): This is a comprehensive toolkit for developers, containing the JRE, a compiler (which converts code into executable programs), and additional tools for Java development. Simple Relationship: JDK is intended for developers to create applications. JRE is designed for users to run applications. JVM acts as the engine that executes the program. What is Bytecode? Bytecode is a unique code generated by Java when you compile your program. It is not meant for human reading but is designed for the JVM to interpret. Bytecode allows Java applications to operate on any device. Procedural vs Object-Oriented Programming: Procedural Programming: This approach emphasizes sequences of steps or procedures. An example is the C programming language. Object-Oriented Programming (OOP): This method centers around objects, akin to real-world entities. Java is a prime example. Key Differences: Procedural: Data and functions are distinct entities. OOP: Data and functions are integrated within objects. OOP promotes better organization and reusability. History of Java 1991: Java originated as a project named "Oak," aimed at small devices. 1995: It was rebranded as "Java" and made available to the public. 1996: The first official version of Java (JDK 1.0) was released. From this make a proper pdf format with proper indention