Java Introduction

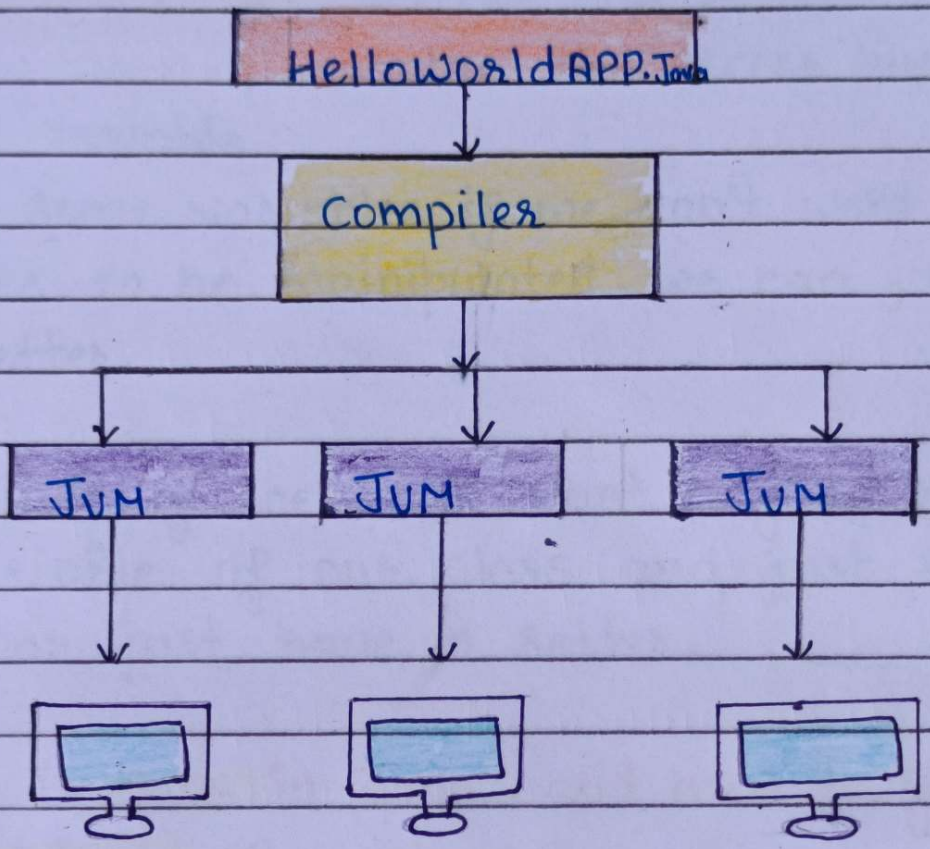
1. What is Java?

Java is a high-level, object-oriented programming language. It's known for its platform-independence, means that a software program or application can run on different types of computer platforms or operating systems without requiring significant modifications or adaptations.

- Which means you can write code on one system and run it on different operating systems without modification.

```
Class HelloworldApp {
        public static void main(String[] args){
                System.out.printIn("Hello");
        }
}
```

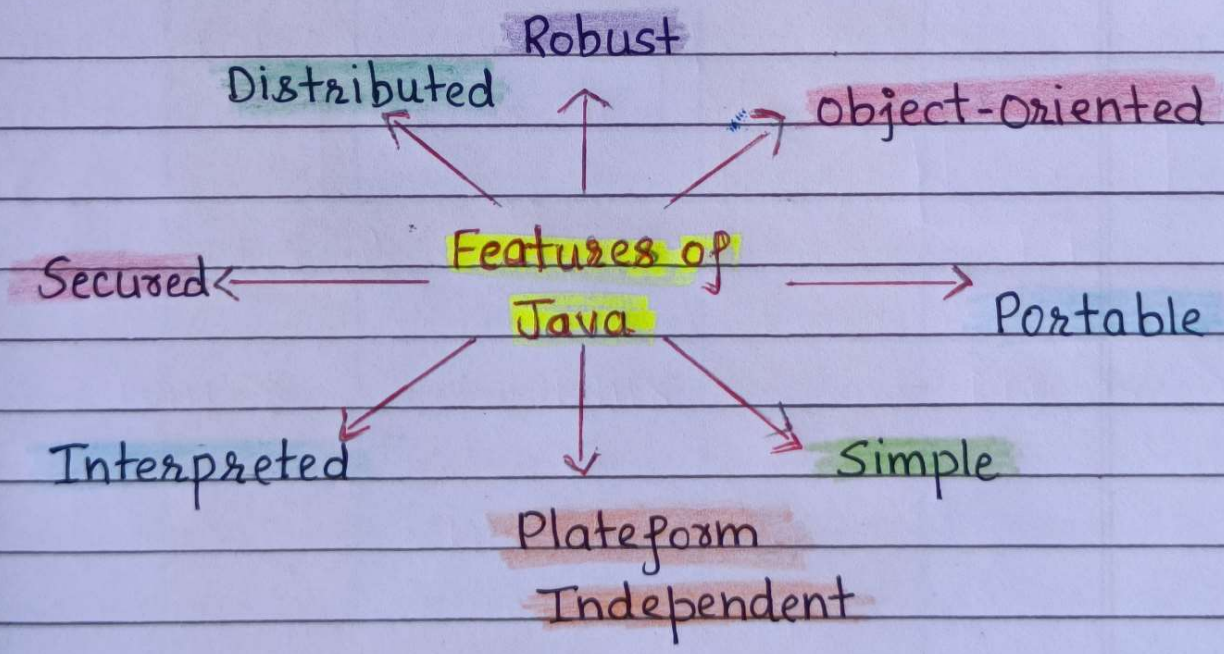
HelloWorldApp.java.



2. What are the main features of Java?

Java main features include :-

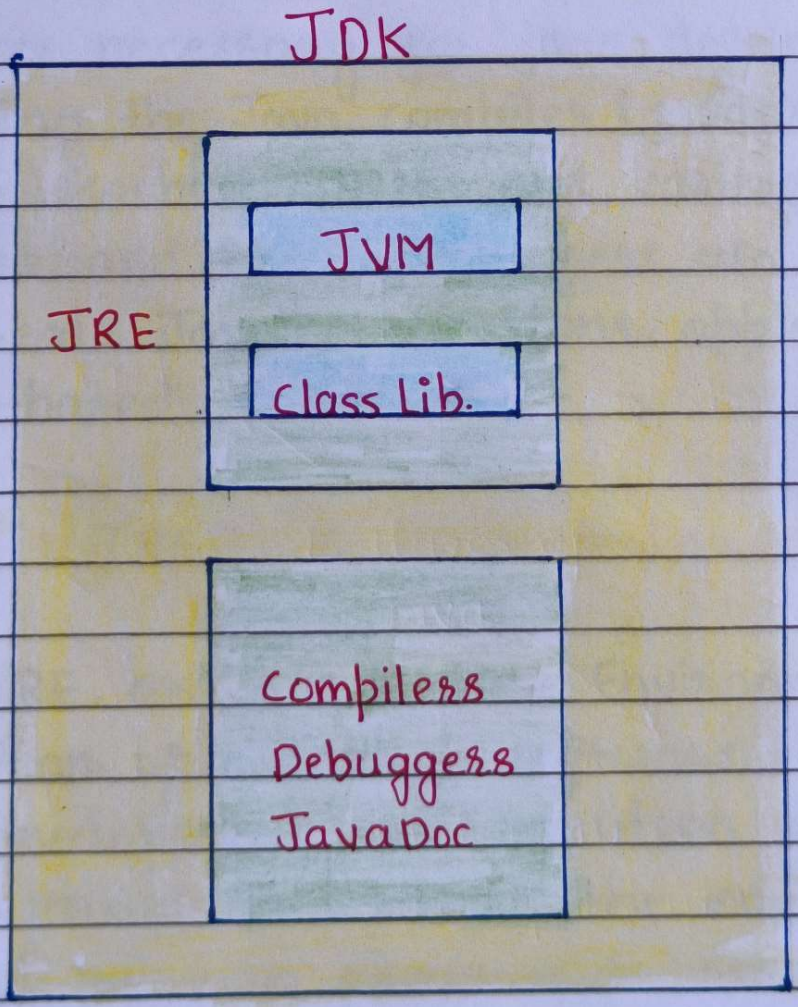
- Simple :- Easy to understand and write.
- Object:-Oriented :- Based on objects and classes.
- Platform:-Independent :- Can run on various system.
- Secured:- Built-in security features.
- Robust :- Handles errors well.
- Multithreaded :- Supports concurrent execution.
- Dynamic :- Can adapt to changing conditions.



3. Explain the main components of Java.

Java consists of three main components:

- JDK (Java Development Kit)
- JRE (Java Runtime Environment)
- JVM (Java Virtual Machine)



4. What is JDK?

JDK stands for Java Development kit. In short, it is a software package or toolkit provided by Oracle (and other vendors) for developing, compiling, and running java applications.

It includes essential tools, libraries and binaries necessary for java development, including the Java compiler (javac), the java virtual Machine (JVM) and various development utilites and API's. Developers use the JDK to create Java applications, applets, and other Java-based software.

5. What is JRE?

The JRE, or Java Runtime Environment, is a collection of essential software tools used in the development and execution of Java applications. It creates the environment needed for java program to run.

Think of it as the practical implementation of the java virtual Machine (JVM). It is a software package comprising libraries and various that the JVM relies on during runtime.

Example:- If you want to write and compile Java code, you need the JDK. If you only want to run Java applications, you can use the JRE.

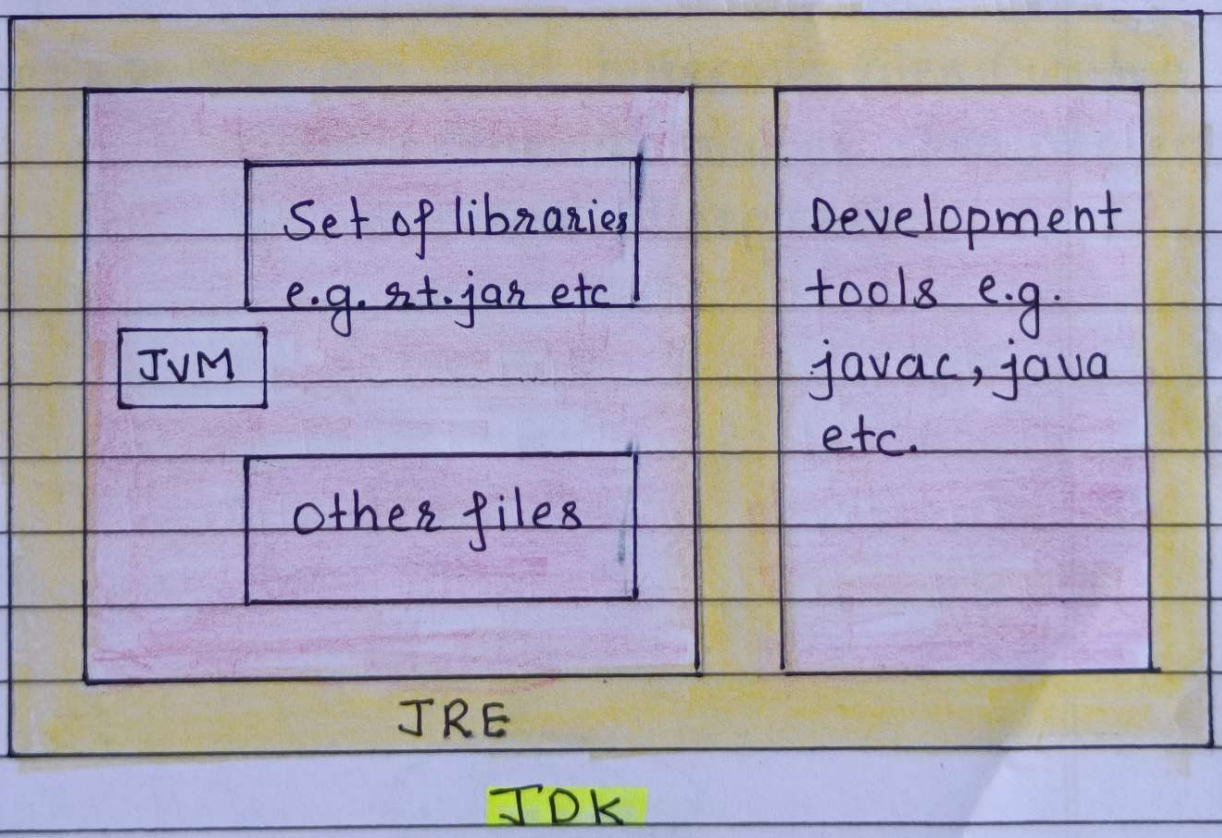
6. What is JVM?

The JVM (Java Virtual Machine) is like a virtual environment that runs Java program and can also handle programs from other languages converted into Java bytecode. It's not a physical machine but a set of rules that work on different systems. While the JVM, JRE, and JDK adapt to specific platforms.

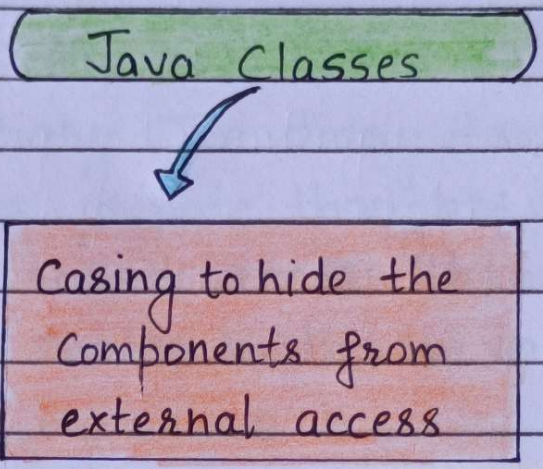
Java itself can run on any platform without modifications.

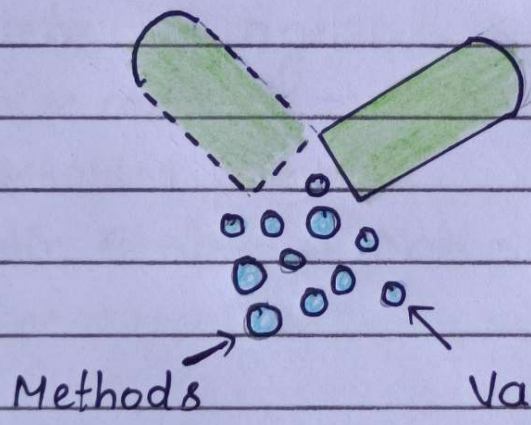
The JVM loads, verifies, and executes code while ensuring it has the right environment to run correctly.

Example :- When you run a java, the JVM translates the bytecode into machine code that can run on your specific operating system.



11 Describe Encapsulation and its benefits.





Encapsulation is the bundling of data (attributes) and methods (functions) that operate on the data into a single unit, known as a class..

It enforces data security by controlling access to the data and ensures that data remains