**Core Java - Assignment**

**Module - 1**

1. **Introduction to Java**

**Theory : -**

1. History of Java :

-> Java is a higher level programming language used worldwide for web applications and software.

Founded by James Gosling in 1991 as Oak under Sun Micro-systems.

The first version was released in 1995, and it was renamed Java.

-> Ownership transition:

-> Currently owned by Oracle Corporation.

-> Users can download and use Java for their applications.

1. Features of Java : Java's popularity stems from its robust and versatile nature, which is a result of several key features:

-> 1. Object- oriented programming :

-> Encapsulation: Bundling data and methods within a class.

-> Inheritance: Creating new classes based on existing ones.

->Polymorphism: Objects of different classes can be treated as objects of a common superclass.

-> 2. Platform Independent:

->"Write Once, Run Anywhere" principle.

-> Java code is compiled into byte code, which can be executed on any system with a JVM.

-> 3. Simple and Robust:

-> Clear and concise syntax.

-> Strong type checking to catch errors early.

-> Automatic memory management (garbage collection).

-> 4. Secure:

->Built-in security features like byte code verification, access control, and cryptography.

-> 5. Multi-threaded:

-> Ability to execute multiple threads concurrently, improving performance and responsiveness.

1. Understanding JVM , JRE and JDK :

-> JVM (Java Virtual machine ) : It's a virtual machine that executes Java byte-code. It handles memory management and garbage collection. It checks the byte-code before execution that to protect program from malicious code.

-> JRE (Java Run time Environment ) : The JRE provides the necessary libraries and components to run Java applications. Inside the JRE there is JVM which executes code.

-> JDK (Java Development Kit ) : The JDK is a comprehensive development kit that includes the JRE and additional tools for developing Java applications. It provides tools like Java compiler like javac, debugger and documentation generator.

1. Setting up the Java environment and IDE :

-> First download JDK to your pc as per your system you can find download it from below link

-> JDK link : [https://www.oracle.com/java/technologies/downloads/](https://www.google.com/url?sa=E&source=gmail&q=https://www.oracle.com/java/technologies/downloads/" \t "C:\\Users\\Vatsal\\AppData\\Local\\Temp\\_blank)

from this link you can download jdk as per your system requirement. After downloading click on it and follow the step which it describes to install on your system then mostly it is successfully installed in your but sometime you have to set up path to for Java.

1. Go to system properties enter to the advanced system setting.
2. Click on the environment variables then add new variable as per your wish like java21
3. Next add it’s value find local directory where jdk installed go to path find bin folder copy that path
4. Set that copied path your variable value.
5. Save the path and close all the windows now open terminal
6. Type Java -version and if it prints jdk of version then you have successfully installed jdk.

-> IDE (Integrated development Environment) : An Integrated Development Environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development. Here are some popular choices:

1. **IntelliJ IDEA:** A powerful and feature-rich IDE, especially popular for Java development.
2. **Eclipse:** A widely-used, open-source IDE with a large community and extensive plug-in ecosystem.
3. Java Program Structure :

-> it starts with public class and your class name. It is mandatory to that class name start with and upper-case letter and you have to make sure Java file had same name as per your class.

-> Next thing is that there is main method which is written in every file and it is entry point of your Java program so you should remember it well. In that main method you can write your program and run it from terminal.

-> Also you have to make sure that completing each line you write semicolon ( ; ) which represents that your code of line is terminated otherwise it gives error message in console.