object oriented programming lab

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Experiment 1: Introduction to Java Environment

LAB TASKS:

Task 1: Exploring JDK, JRE, and JVM

JDK (Java Development Kit):

JDK is an Integrated Development Environment used to develop Java applications and applets. It includes tools for developing as well as debugging the Java program. These are including the compiler, debugger, and more other development tools. Importance: JDK is used to write and compile the Java programs. Without the JDK, it is impossible to change Java code into executable bytecode.

JRE (Java Runtime Environment):

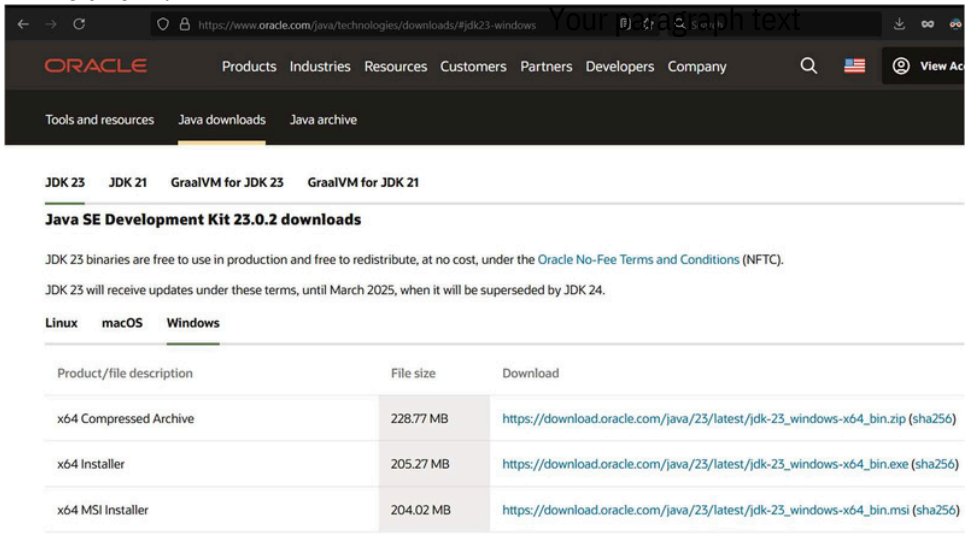
JRE is actually the libraries, Java class files, and other resources required to run Java applications. It includes the JVM and core libraries but doesn't contain tools for its own development, such as a compiler. Importance: This is why JRE ensures that your Java application may run on any system, providing all the necessary runtime environment.

JVM (Java Virtual Machine):

JVM is the execution engine for Java, making the Java programs platform independent. It either interprets or compiles the given bytecode into machine-level instructions for the host machine. Importance: JVM ensures platform independence because it abstracts away the underlying operating system. It also provides features like garbage collection and runtime security.

Task 2: Install the latest JDK and verify the java environment:

1. Install JDK:



Download the latest version of the JDK from Oracle's official website.

Install JDK on your system and verify the setup by running:

- java --version
- javac --version

```
[4, 5, 1, 2, 3]
anshumanrangarh@asx-3 java_f % java --version
java 23.0.1 2024-10-15
Java(TM) SE Runtime Environment (build 23.0.1+11-39)
Java HotSpot(TM) 64-Bit Server VM (build 23.0.1+11-39, mixed mode, sharing)
anshumanrangarh@asx-3 java_f %
```

Task 3: Create a Sample Hello World Program using simple text editor and show the steps to compile and execute the program using command prompt.

1. Write a program to display “Hello World” on the command line:

```
Public class HelloWorld {
Public static void main (string[ ] args ) {
System.out.println(“Hello World”);
}
}
```

2. Compile the code using the following command on a terminal in the directory of the program:

```
javac .\<program-name>.java
```

```
anshumanrangarh@asx-3 Documents %  javac hello.java
```

This generates a .class file with same name as of the program. The .class file is the compiled code which can be run on a JVM in any machine.

3. To run the compiled code run the following command:

```
java <program-name>
```

```
anshumanrangarh@asx-3 Documents % java hello
hello world
```

Task 4: Display your name and complete address in different lines.

Code to Display name and address in different lines:

```
public class display {
    public static void main(String[] args) {
        System.out.println("Name: Satvik Raj\nAddress: UPES, Energy Acres \n\t
Bidholi, Deradun");
    }
}
```

Output:

```
Name: Anshuman Rangarh
Address: UPES
        Bidholi, Dehradun
```