ASSIGNMENT NO.1

1. Reading Assignment: A Short History of Java

- **Task**: Read about the history and development of Java.
- **Link**: http://sunsite.uakom.sk/sunworldonline/swol-07-1995/swol-07-java.html

what I got form this:

JAVA or oak was developed by green team consisting of james gosling.eta. It was Sun technologies In the Java world, a browser becomes a framework. it was in market at 1996 as java 1.0

2. Reading Assignment: Java Language Features

- **Task**: Learn about the main features of Java.
- **Link**: https://javaalmanac.io/features/

Remove Permanent Generation. Remove Permanent Generation. Lambda Expressions. Default Methods in Interfaces. Effectively Final Variables. Type Use Annotations. Repeating Annotations. Streams (java.util.stream). These are most prominent features added in java 8

3. Reading Assignment: Which Version of JDK Should I Use?

- **Task**: Find out which JDK version is right for you.
- **Link**: https://whichjdk.com/

there is not only oracle who is java distributors. amazon, azul, IBM, Microsoft also produce and market there own jdk. OpenJDK builds by Oracle (jdk.java.net) Oracle Java SE Development Kit (JDK), Adoptium Eclipse Temurin AdoptOpenJDK, Azul Zulu Azul Zing BellSoft Liberica JDK, IBM Semeru Runtime Amazon Corretto Microsoft Build of OpenJDK Alibaba Dragonwell, SapMachine, Red Hat OpenJDK, GraalVM

4. Reading Assignment: JDK Installation Directory Structure

- **Task**: Understand the folder structure and files in the JDK installation.
- **Link**: https://docs.oracle.com/javase/8/docs/technotes/tools/windows/jdkfiles.html

ASSIGNMENT NO.1

my takeway:

```
jdk-1.8 {// root directory(contains
library,license, and src.zip
that has source code for java platform )}
   bin //(path set is given of this only.enables dev tools)
      java* //
      javac*
      javap*
      javah*
      javadoc*
   lib //(build, debug and customize)
      tools.jar // eg house build(classes will be bricks, cement etc)
                                   kartoye and
                                   tools will be like saws, drills etc
      dt.jar // how to design and display java components
                                   (eg ineterior designer is ide and room is
application)


   jre  // implementation of java tools
      bin // serves as app launcher.same as bin but donot need path
         java*
      lib //rt.jar file
         applet // reduce stratup time for large applets
         ext
            jfxrt.jar
```

localdata.jar

fonts

security

sparc

server

client

rt.jar

charsets.jar

jdk

flow :jdk(bin, lib , jre)

5. Reading Assignment: About Java Technology

- **Task**: Read about the basics of Java technology and its components.
- **Link**: https://docs.oracle.com/javase/tutorial/getStarted/intro/definition.html

my take:

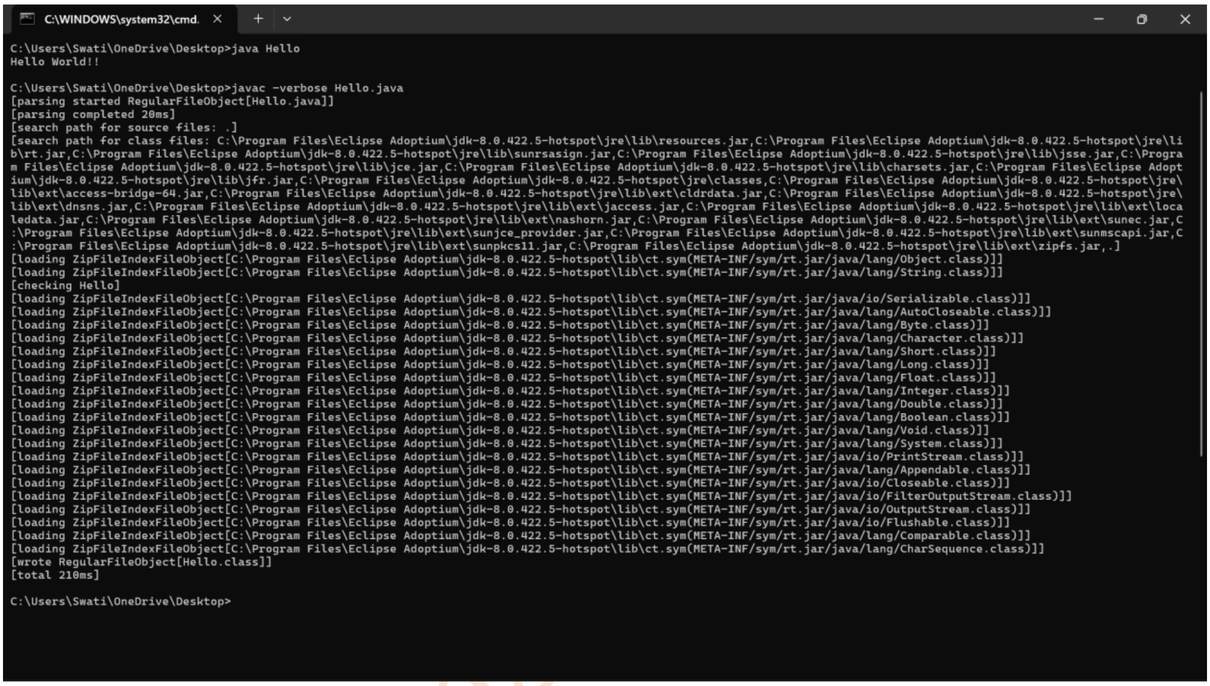
java is platform independent ie kontya pan platform var run karu shkato
and java is software and works on top of hardware
java platform has two components JVM and APIA
API is a large collection of ready made software that provide
many useful packages

6. Coding Assignments

1. **Hello World Program**: Write a Java program that prints "Hello World!!" to the console.
2. **Compile with Verbose Option**: Compile your Java file using the `-verbose` option with `javac`. Check the output.
3. **Inspect Bytecode**: Use the `javap` tool to examine the bytecode of the compiled `.class` file. Observe the output.

```
class Hello{
        public static void main(String[] args){
                System.out.println("Hello World!!");
        }
}
```

Ans –



```
C:\Users\Swati\OneDrive\Desktop>java Hello
Hello World!!

C:\Users\Swati\OneDrive\Desktop>javac -verbose Hello.java
[parsing started RegularFileObject[Hello.java]]
[parsing completed 20ms]
[search path for source files: .]
[search path for class files: C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\resources.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\li
b\rt.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\sunrsasign.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\jsse.jar,C:\Progra
m Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\jce.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\charsets.jar,C:\Program Files\Eclipse Adopt
ium\jdk-8.0.422.5-hotspot\jre\lib\jfr.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\classes,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\
lib\ext\access-bridge-64.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\cldrdata.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\
lib\ext\dnsns.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\jaccess.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\loca
ledata.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\nashorn.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\sunec.jar,C
:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\sunjce_provider.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\sunmscapi.jar,C
:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\sunpkcs11.jar,C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\jre\lib\ext\zipfs.jar,.]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Object.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/String.class)]]
[checking Hello]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/io/Serializable.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/AutoCloseable.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Byte.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Character.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Short.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Long.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Float.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Integer.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Double.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Boolean.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Void.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/System.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/io/PrintStream.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Appendable.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/io/Closeable.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/io/FilterOutputStream.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/io/OutputStream.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/io/Flushable.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/Comparable.class)]]
[loading ZipFileIndexFileObject[C:\Program Files\Eclipse Adoptium\jdk-8.0.422.5-hotspot\lib\ct.sym(META-INF/sym/rt.jar/java/lang/CharSequence.class)]]
[wrote RegularFileObject[Hello.class]]
[total 210ms]

C:\Users\Swati\OneDrive\Desktop>
```

7. Reading Assignment: The JVM Architecture Explained

- **Task**: Learn about how the Java Virtual Machine (JVM) works.
- **Link**: https://dzone.com/articles/jvm-architecture-explained

JVM

1 Loading
 CLASSES
 ....> BOOTSTRAP LOADER(Highest priority, rt.jar)
                              extension classloader(ext , jre/bin)
                              App classloader(env variable, app level work)
2. Linking
................> Verify -bytecode verify bytecode proper
                              Perpare- static variables memory allocated
                              Resolve- all memory ref with original ref
                              from method area
3. Initialization
................> static variables will be assigned
Runtime data area'
.............>
method area - class variables

heap - one heap per JVM same as method
stack - different. it is thread safe

8. Reading Assignment: The Java Language Environment: Contents

- **Task**: Explore the content and features of the Java language environment.
- **Link**: https://www.oracle.com/java/technologies/language-environment.html