week 0_2:

getting started with Java

rajin teaches programming

INTRODUCTION TO JAVA:

– WHAT IS JAVA?

Java is a high-level, object-oriented programming language that follows the "write once, run anywhere" philosophy. Java code, once compiled, can run on any platform that has a Java Virtual Machine (JVM), making it highly portable.

– KEY CHARACTERISTICS:

Platform Independence: Java programs are compiled into bytecode, which can run on any machine that has a JVM installed.

Object-Oriented: Java follows the object-oriented programming paradigm, emphasizing reusability, modularity, and maintainability.

Automatic Memory Management: Java has a built-in garbage collector that automatically manages memory, reducing memory leaks.

Rich Standard Library: Java provides an extensive library of pre-built methods and classes, making it easier to perform various tasks like file handling, networking, and data structures.

– KEYWORDS:

JVM (Java Virtual Machine): The virtual machine that runs Java bytecode on any platform.

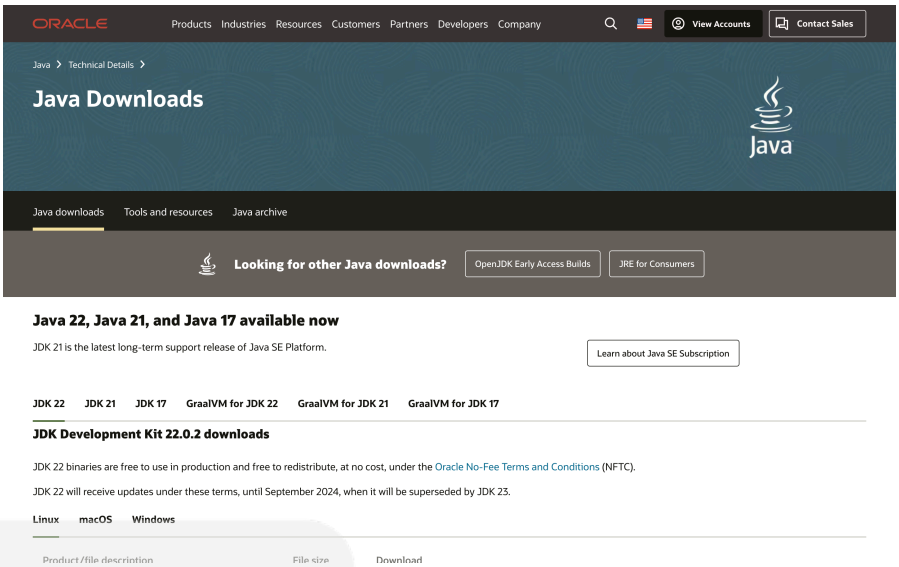
JRE (Java Runtime Environment): Provides the environment for executing Java programs.

JDK (Java Development Kit): A development kit that includes the JRE and development tools like the Java compiler.

GETTING STARTED WITH JAVA ON WINDOWS:

- SETTING UP THE ENVIRONMENT:

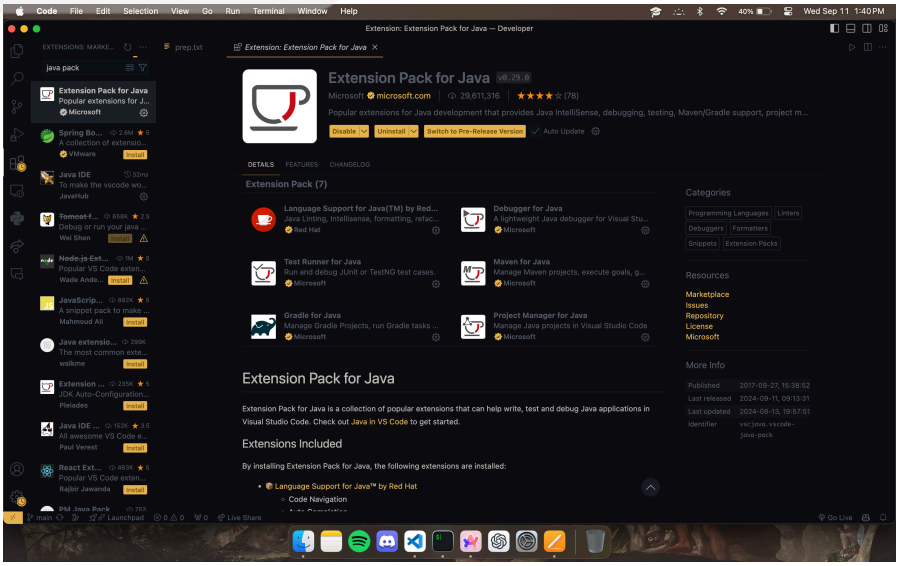
Download and install the latest **JDK** from the official Oracle website.



Then, set up the **JAVA_HOME** environment variable after installation (Will be shown in class).

- SETTING UP VSCODE:

If you haven't already, download and install VSCode.



Go to the Extensions tab (left sidebar), search for "**Java Extension Pack**" and install it. This will add support for writing and running Java in VSCode.

WRITING YOUR FIRST PROGRAM:

Create a new project folder, and name it **Main.java** (It must start with a capital letter). The file name must also match the class name, as this is a **strict** rule in Java for public classes.

– GETTING OUTPUT:

PRINT SYNTAX

```
public class Main {

    public static void main(String[] args) {

        System.out.println("Hello, World!");
    }
}
```

– WHAT IT MEANS:

– **public class Main**: The Main class is a blueprint for your program. Every Java program starts by executing the main method in one of its classes.

– **File name must match the class name**: In Java, if your class is public (which is typical for the entry class of a program), the file name must exactly match the class name. So, if the class is named Main, the file must be Main.java (even the case must be matched).

– **public static void main(String[] args)**: This is the starting point of any Java application. When you run a program, the JVM looks for the main method to begin execution.

– **public**: The method can be called from anywhere.

– **static**: It belongs to the class itself, not an instance of the class.

– **void**: The method does not return any value.

– **main(String[] args)**: This is the method signature, where args is an array of strings passed to the program as arguments.

System.out.println("Hello, World!"): This line prints the text "Hello, World!" to the console. System.out is a built-in Java object that handles output, and println is a method that prints the specified message followed by a new line.

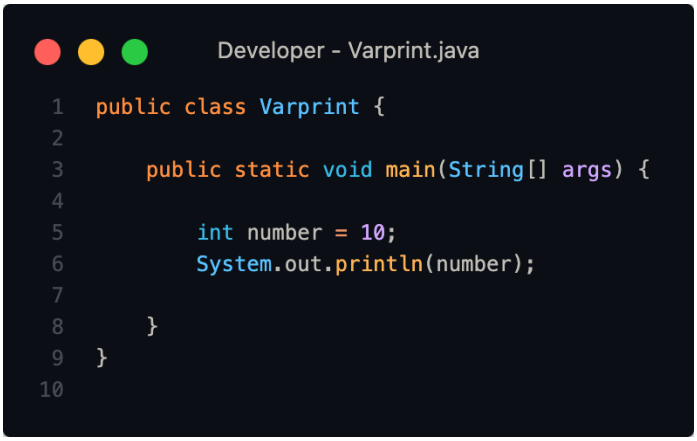
USING THE System.out.println() METHOD:

The System.out.println() method is a versatile function in Java used to print messages, variables, and even formatted strings to the console. Let's learn how to use this method effectively.

– BASIC USAGE:

code showing a basic print statement in Java. Keep in mind that a new line is always added to the end when you use the println() method.

– PRINTING VARIABLES:



this method can also be used to print variables of different data types like integers, floats, or strings.

Developer - Combineprint.java

```java
public class Combineprint {

    public static void main(String[] args) {

        String name = "Alice";
        System.out.println("Hello, " + name + "!");  // Output: Hello, Alice!

    }
}
```

you can also combine text with variables by concatenating them with the '+' operator, making it much easier to print things than in C (which used printf).

Developer - Multicombineprint.java

```java
public class Multicombineprint {

    public static void main(String[] args) {

        int age = 25;
        String name = "Bob";
        System.out.println("Name: " + name + ", Age: " + age);  // Output: Name: Bob, Age: 25

    }
}
```

in the same manner, you can print multiple variables by using concatenation.

– print() VS println():

Developer - Main.java

```java
public class Main {

    public static void main(String[] args) {

        System.out.print("Hello");
        System.out.print("World");
    }
}
```

```
cd "/Users/rajin/Developer/" && javac Main.java && java Main
~/Developer
cd "/Users/rajin/Developer/" && javac Main.java && java Main
HelloWorld
~/Developer
```

from the output on the right, you can see that System.out.print() prints the text but does not move the cursor to the next line after printing.

from the output on the right, you can see that System.out.println() prints the text and moves the cursor to the next line after printing.

So, in theory, you could add multiple “lines” after what you print simply by typing **System.out.println\nln\nln();** (and so on and so forth).

SUMMARY:

Class and File Name Matching: In Java, a file containing a public class must have the same name as the class (e.g., Main.java for the Main class).

public static void main(String[] args): This is the entry point of every Java program. It is the method that the JVM calls to start the execution.

System.out.println(): This method is used to print messages, variables, or results to the console. The println function moves the cursor to the next line after printing, while print() does not.

Formatted Output: The printf() method allows you to format output in a structured manner.

FURTHER READING:

- BOOKS:

- “Head First Java" by Kathy Sierra and Bert Bates

- “Java: The Complete Reference" by Herbert Schildt

- ONLINE:

Oracle Java Documentation

Java GeeksForGeeks Online Tutorial

next class 1_0:

programming basics revisited

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reach out for classes at: rajin.khan2001@gmail.com