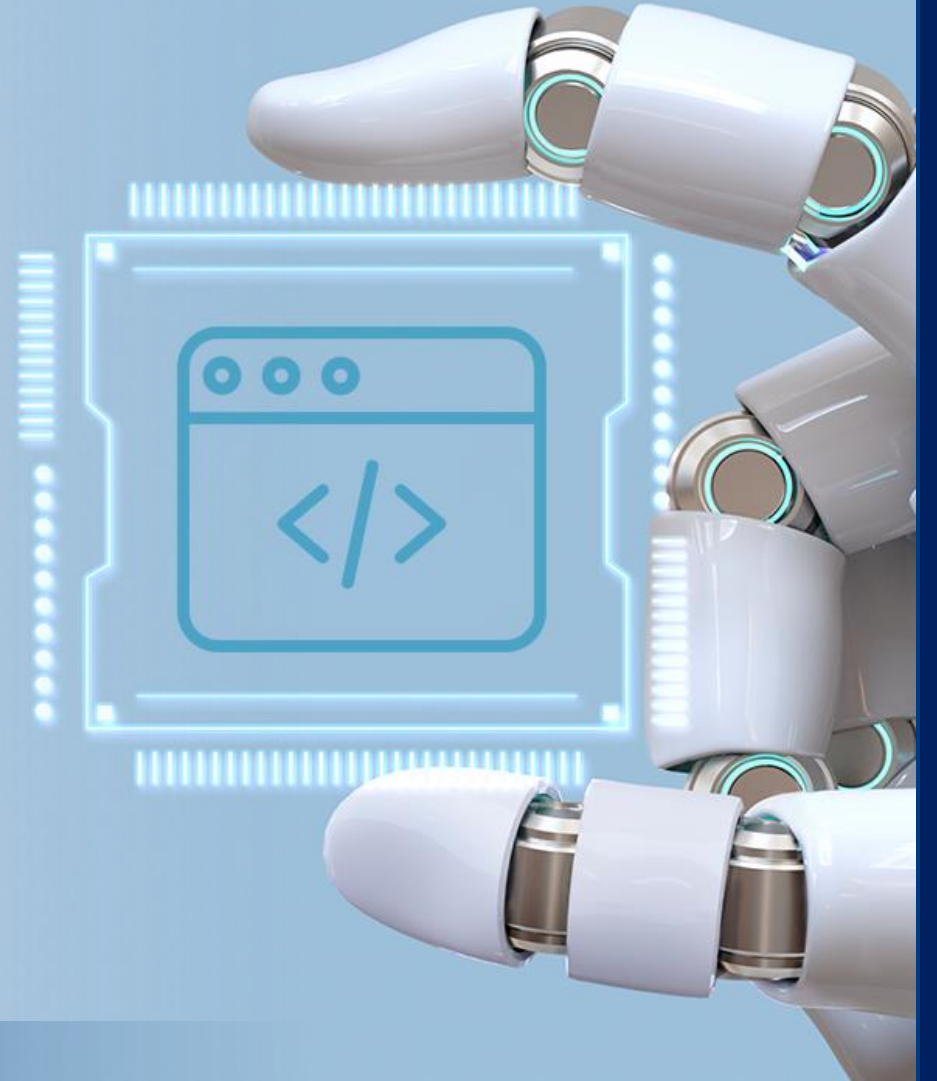# edunet
foundation

Fundamentals of Software Development

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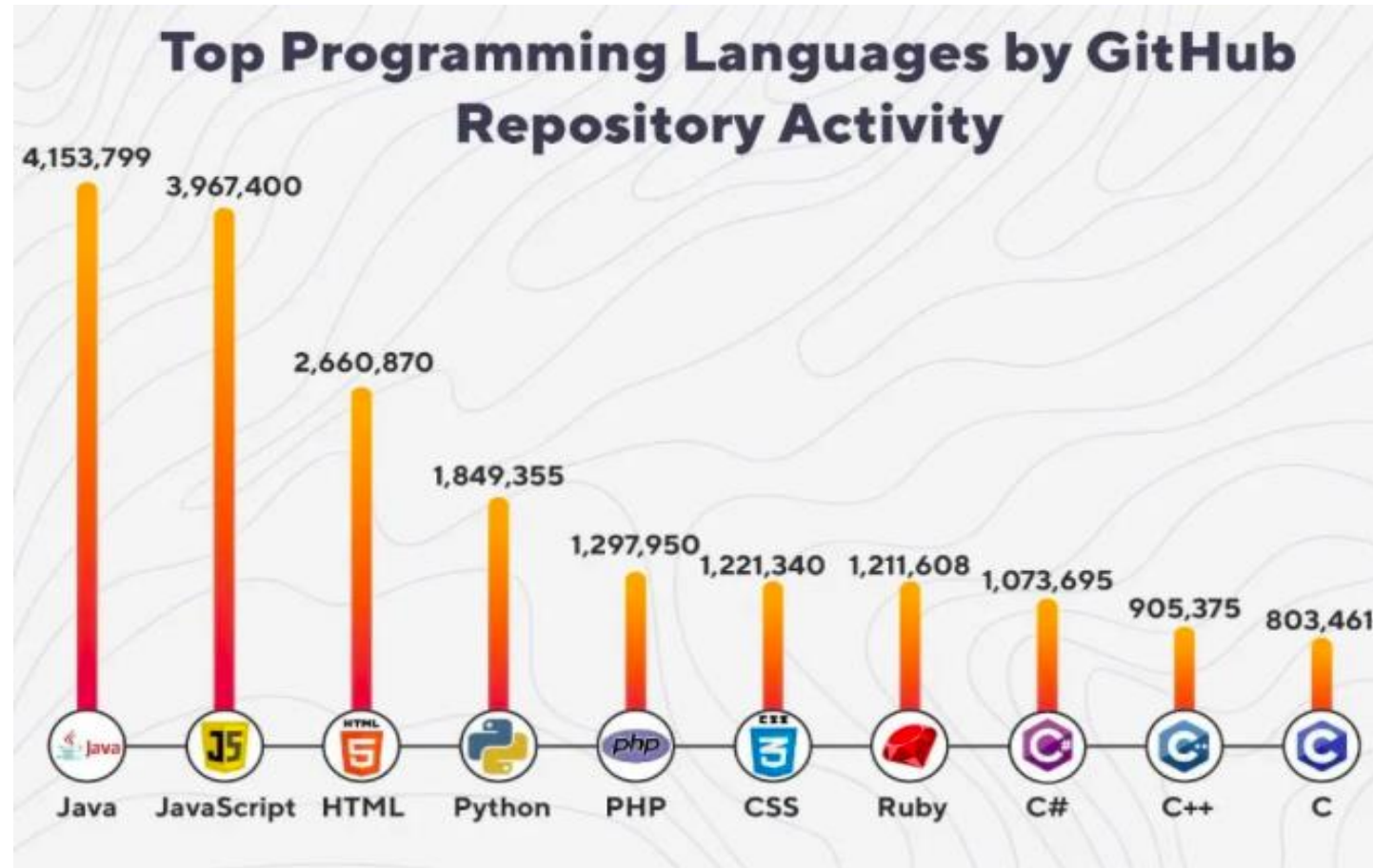
Chapter 2

Essentials of Java Programming
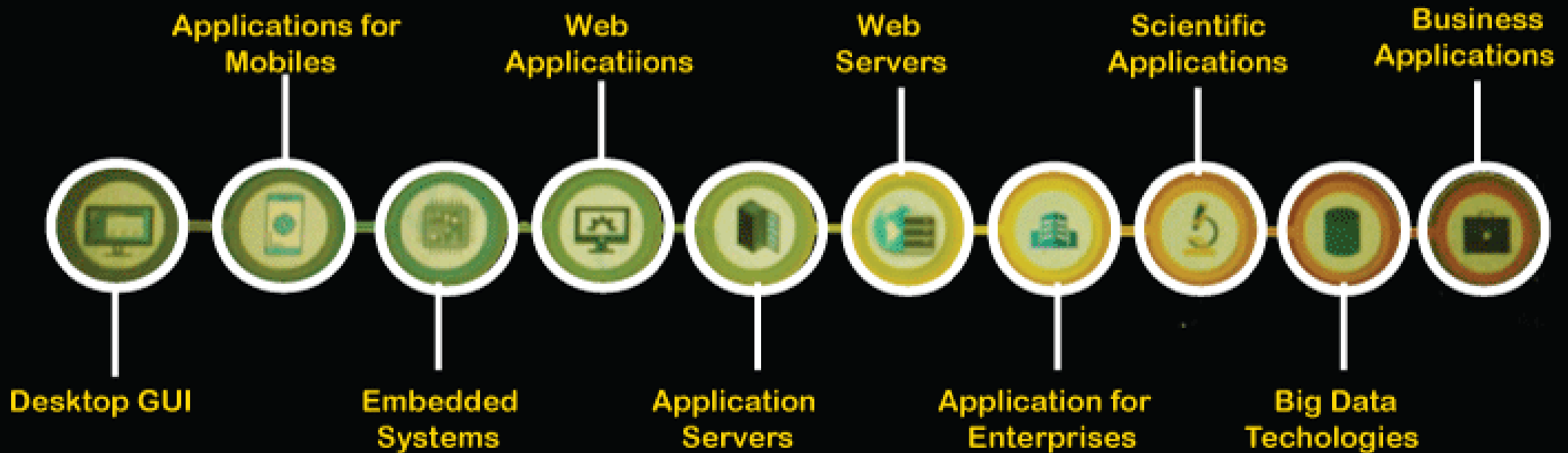
Agenda

Revisiting Java Fundamentals

- Java Variables

- Data Types

- Java Operators

- Input and Output

- Java Expressions

- Blocks, Comment

Top Programming Languages by GitHub Repository Activity

Language	Activity
Java	4,153,799
JavaScript	3,967,400
HTML	2,660,870
Python	1,849,355
PHP	1,297,950
CSS	1,221,340
Ruby	1,211,608
C#	1,073,695
C++	905,375
C	803,461

Survey by Industry wired on 23rd January 2023

Source: https://industrywired.com/10-real-world-applications-of-java-programming-language/

Introduction

- Welcome everyone to the session on Java fundamentals.

- Java is a popular object-oriented programming language that was developed by Sun Microsystems (now owned by Oracle Corporation) in the mid-1990s. It is widely used for building a wide range of applications, from simple command-line tools to complex enterprise systems.
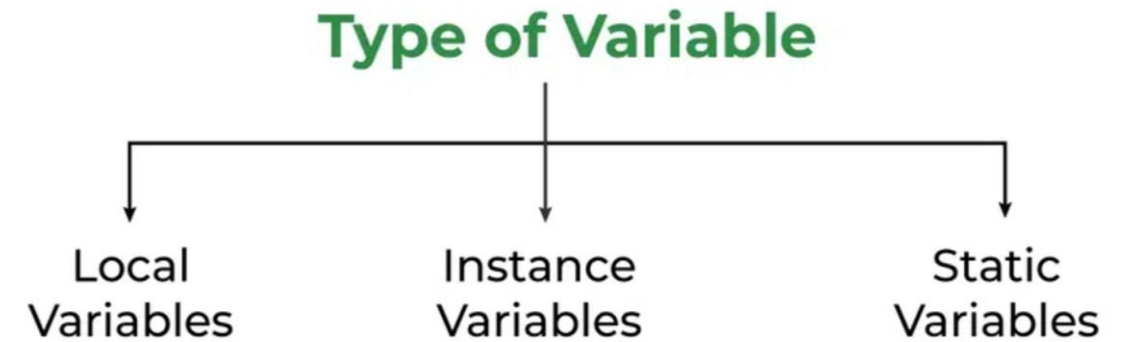
Java

Fundamentals

Java Variables

Types of Variable

- A variable defined within a block or method or constructor is called a local variable.

- Instance variables are non-static variables and are declared in a class outside of any method, constructor, or block.

- Static variables are also known as class variables.

- These variables are declared similarly to instance variables. The difference is that static variables are declared using the static keyword within a class outside of any method, constructor, or block.
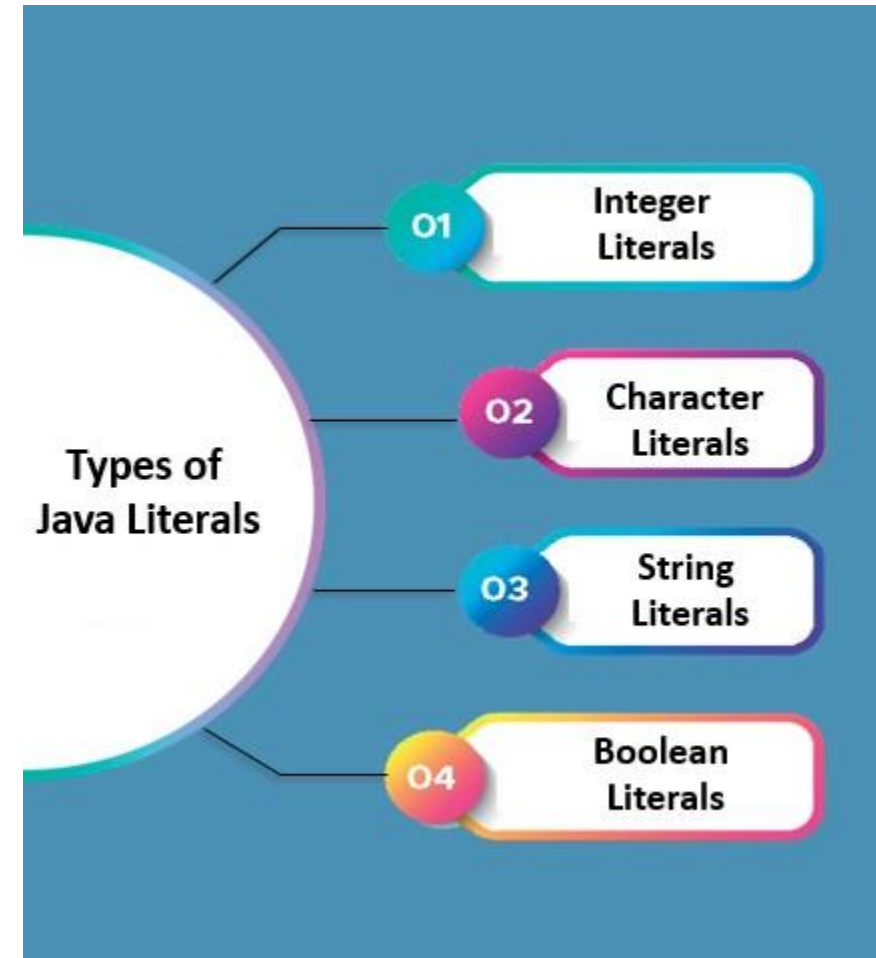
Type of Variable

Local Variables   Instance Variables   Static Variables

Java Literals

- Literals are data used for representing fixed values.
- They can be used directly in the code.

Different types of literals are:

- Boolean Literals
- Integer Literals
- Floating-point Literals
- Character Literals
- String literals

Types of Java Literals

- 01 Integer Literals
- 02 Character Literals
- 03 String Literals
- 04 Boolean Literals

Java Data Types

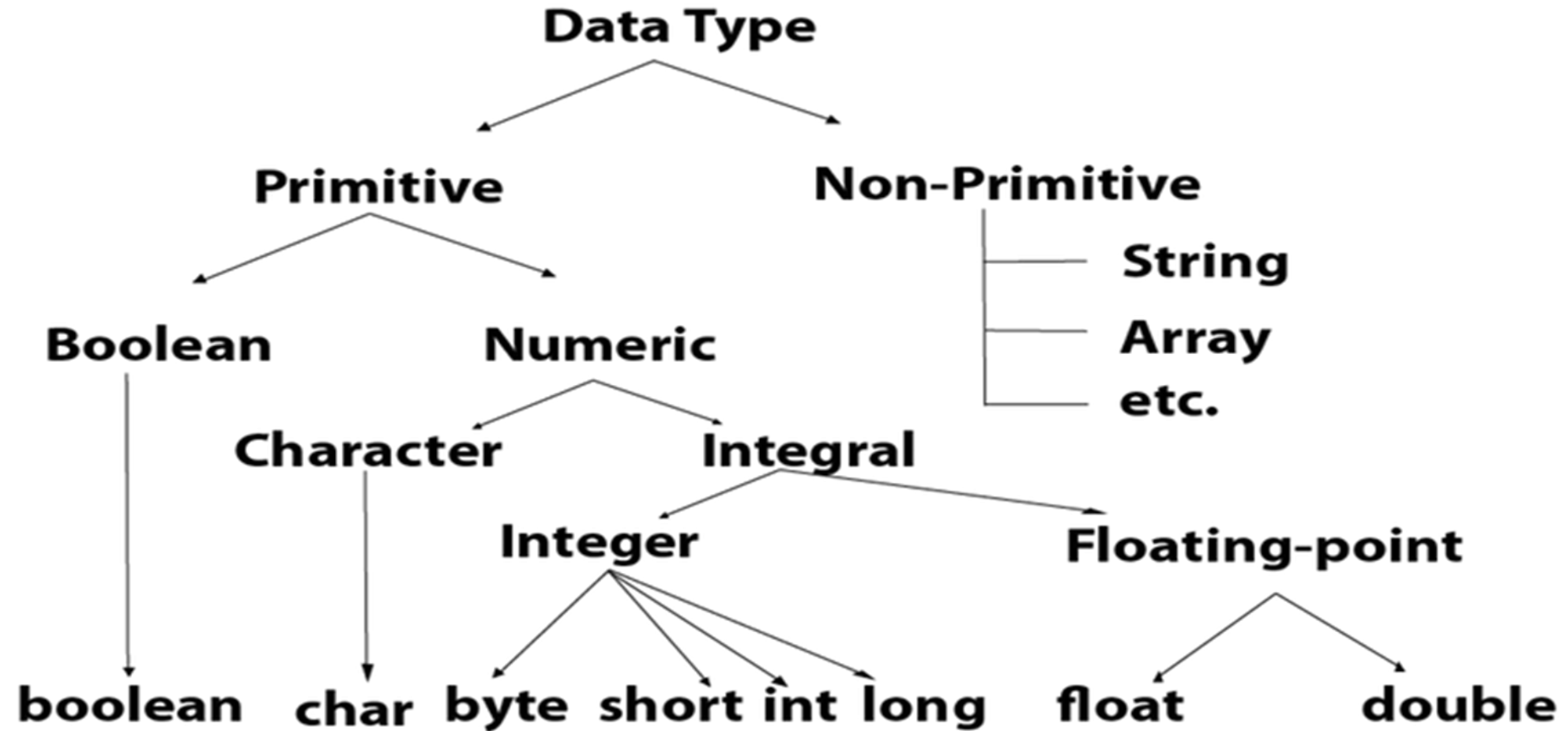Data types specify the type of data that can be stored inside variables in Java.

There are 8 **Primitive Data Types:**

Non-primitive data types

1. Boolean
2. Byte
3. Short
4. Int
5. Long
6. Double
7. Float
8. Char

1. String
2. 2. Array etc.

Java Data Types

Lab Exercise

Hands On - 1: Java program that demonstrates variable concepts

Hands On - 2: Example to understand the types of variables in Java

Hands On - 3: Java program that demonstrates the clarity of the 8 primitive data types and their range of values

Hands On - 4: Java program that demonstrates the non-primitive data types

Java Keywords

Keywords represent the reserved words in the Java programming language and have specific meanings and functionalities within the language.

abstarct	continue	for	new	switch
assert	default	goto	package	synchronized
boolean	do	if	private	this
break	double	implements	protected	throw
byte	else	import	public	throws
case	enum	instanceof	return	transient
catch	extends	int	short	try
char	final	interface	static	void
class	finally	long	strictfp	volatile
const	float	native	super	while

Java Operators

Operators are symbols that perform operations on variables and values.

Operators in Java can be classified into 6 types:

Arithmetic Operators	Assignment Operators
Relational Operators	Bitwise Operators
Logical Operators	Unary Operators

Java Basic Output and Input

- **Java Output:** In Java, we simply use

System.out.println(); or System.out.print(); or System.out.printf();

- **Java Input:** Java provides different ways to get input from the user. One of them is by using object of Scanner class.

First, we need to import java.util.Scanner package.

Then, we need to create an object of the Scanner class.

We can use the object to take input from the user.

Java Expressions, Statements and Blocks

- **Java Expressions:** A Java expression consists of variables, operators, literals, and method calls.

- **Java Statements:** In Java, each statement is a complete unit of execution.

- **Expression statements:** We can convert an expression into a statement by terminating the expression with a ;.

- **Declaration Statements:** In Java, declaration statements are used for declaring variables.

- **Java Blocks:** A block is a group of statements (zero or more) that is enclosed in curly braces { }. A block may not have any statements.

Java Comments

- Comments are a portion of the program that are completely ignored by Java compilers. They are mainly used to help programmers to understand the code.

In Java, there are two types of comments:

Single-line Comment: A single-line comment starts and ends in the same line. To write a single-line comment, we can use the // symbol.

Multi-line Comment: When we want to write comments in multiple lines, we can use the multi-line comment. To write multi-line comments, we can use the /*....*/ symbol.

Lab Exercise

Hands On - 5: Simple Java program that demonstrates the various operators in Java

**Hands On - 6**: Example to demonstrate the difference between print() and println()

Hands On - 7: Example of how to use the Scanner class to read user input from the console

Hands On - 8: Example of single-line and multi-line comments

Conclusion

Well done! You have completed this course and now you understand about:

- Java Variables

- Data Types in Java

- Java Keywords

- Java Operators

- Java Output and Input

- Java Expressions, Statements, and Blocks

- Java Comments
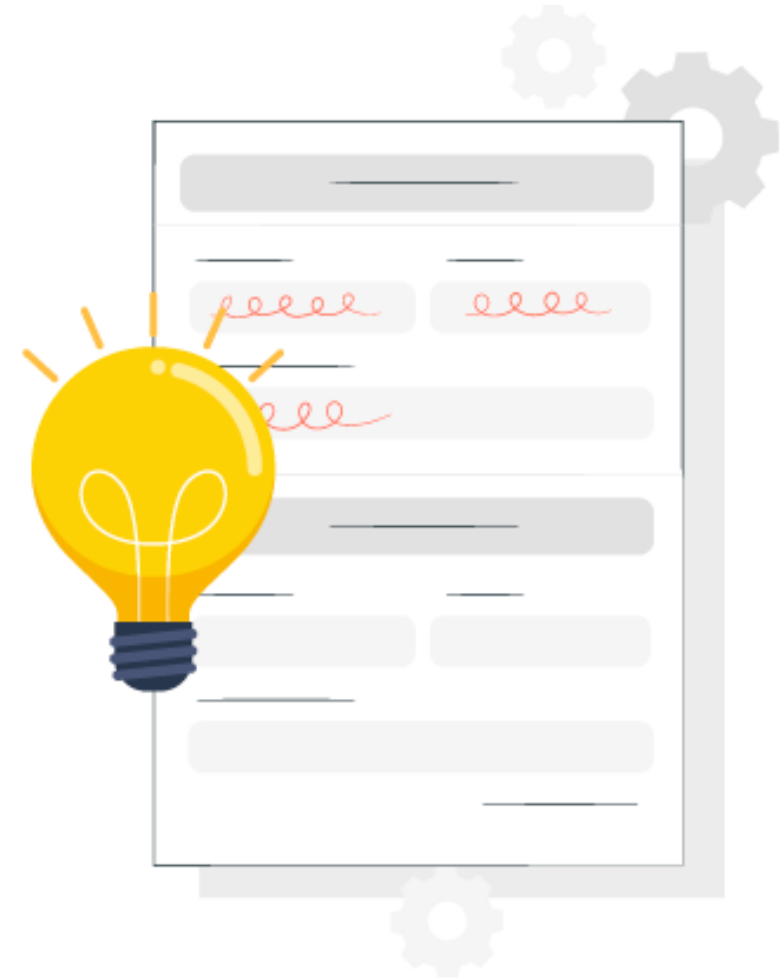
Quiz

1. Which of the following is not a primitive data type in Java?

a) int

b) double

c) String

d) boolean

Answer: c
String

Quiz

2. How many kinds of variables in Java?

a) 1

b) 2

c) 3

d) 4

Answer: c
3

Quiz

3. What will be the value of result after executing the following code?
```
int x = 10;
int y = 3;
int result = x % y;
```

a)   1

b)   2

c)   3

d)   0

Answer: a

1

Quiz

4. Which of the following is a valid Java keyword?

a)   myKeyword

b)   class

c)   variable

d)   Function

Answer: b
class

Quiz

5. Which of the following options correctly represents a single-line comment in Java?

a)   /* This is a comment */

b)   // This is a comment

c)   <!-- This is a comment -->

d)   "' This is a comment "'

Answer: b
// This is a comment

References

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Thank You!