Git & Github

Create GitHub Repository

- Open https://github.com/
- Create or log in to an account
- Make repository
- Download Git https://git-scm.com/install/windows
- Open a terminal or CMD and verify the version [git - - version]
- Configure Git [git config --global user.email “your-email@gmail.com"]

Clone Repository

- Copy repository URL
- Clone repository [git clone URL]
- Make change in readme.md file
- Push changes
  - [git add .]
  - [git commit -m “msg”]
  - [git push]

Java Main Function

Syntax

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

Gradle

What is Gradle?

* **build tool** and **dependency manager** for java

- Build tool for Java
- Compile and run your code
- Download and manage dependencies (package)
- Run tests
- Package project & deploy

Folder Structure

```
project-root/
│
├── gradle/                    # Gradle wrapper files
│   └── wrapper/
│       ├── gradle-wrapper.jar
│       └── gradle-wrapper.properties
│
├── gradlew                    # Gradle wrapper (Mac/Linux)
├── gradlew.bat                # Gradle wrapper (Windows)
│
├── build.gradle                # Build configuration
├── settings.gradle             # Project name & modules
├── gradle.properties           # Optional Gradle configs
│
├── src/
│   ├── main/
│   │   ├── java/               # Application source code
│   │   │   └── org/example/
│   │   │       └── App.java
│   │   └── resources/          # config files (yml, properties)
│   │
│   └── test/
│       ├── java/               # Test classes
│       │   └── org/example/
│       │       └── AppTest.java
│       └── resources/
│
└── build/                      # Auto-generated output (DON'T edit)
```

Working on a remote repository

1. Create github repository
2. [git clone URL]
3. Create gradle project
4. [git add .]
5. [git commit - m “msg”]
6. [git push]

Pushing local folder on github repository

1. Create gradle project
2. Create github repository
3. [git init]
4. [git remote add origin URL]
5. [git branch -M main]
6. [git add .]
7. [git commit -m “msg”]
8. [git push -u origin main]

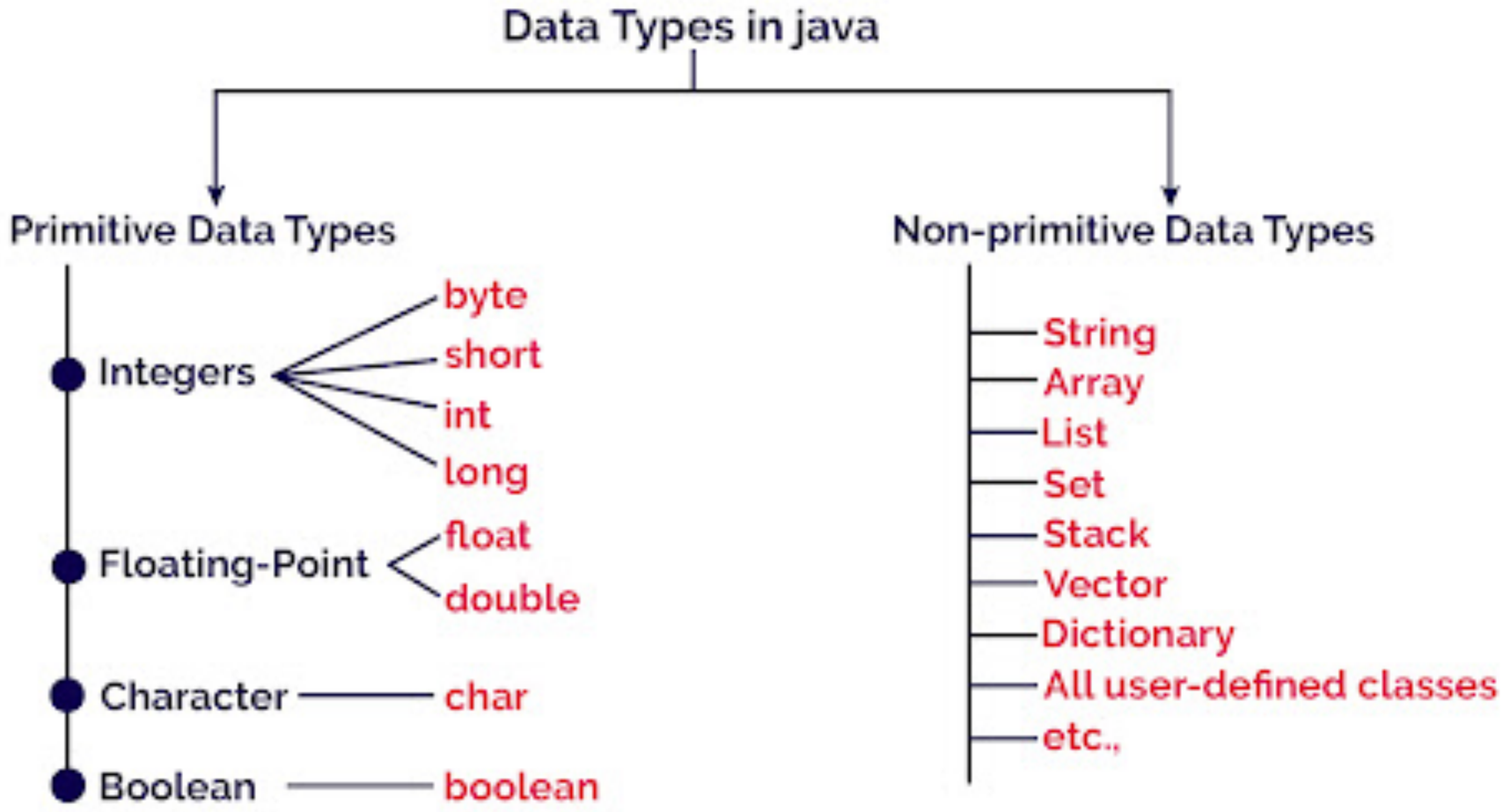
Variable

- What is a variable
  - A variable is like a small box in memory where you keep some information
  - Syntax: [**data type**] [variable name] = [value]
    1. int age = 25;
    2. String name = “Dheeraj";
    3. double price = 99.50;

Data Type

- The data type will tell what kind of value a variable will store
- Java has 2 categories of data types
    1. Primitive data type
    2. Non-Primitive data type

Data Type Categories



Primitive Data Type

byte	1 byte	10	Small numbers (-128 to 127)
short	2 bytes	200	Medium numbers
int	4 bytes	10,000	Normal integer numbers
long	8 bytes	100000L	Very large numbers
float	4 bytes	10.5f	Decimal (less accurate)
double	8 bytes	10.567	Decimal (more accurate)
char	2 bytes	'A'	Single character
boolean	1 bit	true/false	Conditions (true/false)

Quiz

- https://create.kahoot.it/share/basic-of-data-type-quiz/1e950c60-1c4b-4d8a-8022-8dc2082a2d3c

Non-Primitive Data Type

String	`String name = "Dheeraj";`	Sequence of characters
Array	`int[] arr = {1,2,3};`	Stores multiple values of same type
Class	`class Student {}`	Blueprint for creating objects
Object	`Student s = new Student();`	Instance created from class
Interface	`interface Animal {}`	Contains abstract methods
Enum	`enum Day { MON, TUE }`	Collection of constants

Primitive vs Non Primitive Data Type

- Primitive data stores the actual value directly.
- Non-primitive data types store the reference (address) of the value in memory.
- Primitive data type stored in stack or heap?

Quiz

- https://create.kahoot.it/details/421632aa-a66e-4d29-9556-ea9e7ac552a1

Operator

- Operators are **symbols** that perform **actions on variables or values**
- Example: +, -, *, /, ==, <, &&, etc.
- Java has 7 types of operators.

Type of Operator

1. Arithmetic Operator
2. Assignment Operator
3. Relational Operator
4. Logical Operator
5. Unary Operator
6. Bitwise Operator
7. Ternary Operator

1. Arithmetic Operator

Used for basic math

+	Addition	a + b
−	Subtraction	a − b
*	Multiplication	a * b
/	Division	a / b
%	Modulus (remainder)	10 % 3 = 1

2. Assignment Operators

Used to assgin values

=	Assign	x = 10
+=	Add & assign	x += 5 (x = x + 5)
-=	Sub & assign	x -= 2
*=	Multiply & assign	x *= 3
/=	Divide & assign	x /= 2

3. Relational Operators

Used to compare values, and it return true/false

==	Equal
!=	Not equal
>	Greater than
<	Less than
>=	Greater or equal
<=	Less or equal

4. Logical Operators

Used with boolean values

&&	AND (both conditions must be true)
||	**OR** (at least one condition must be true)
!	NOT (reverses result)

5. Unary Operators

Operate on one operand.

+	Positive
−	Negative
++	Increment
−−	Decrement

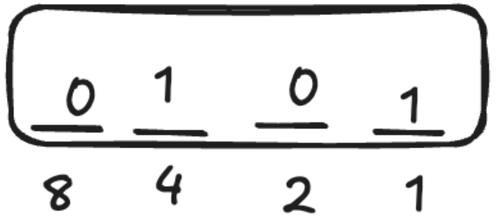
6. Bitwise Operatos

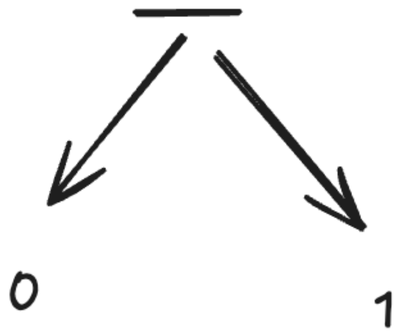
These operators work on **bits (0 and 1)** at the binary level.

Operator	Name	Meaning
&	AND	1 if both bits are 1
|	`	OR
^	XOR	1 if bits are different
~	NOT	Flips bits (1→0, 0→1)
<<	Left Shift	Multiply by 2
>>	Right Shift	Divide by 2
>>>	Unsigned Right Shift	Shift without keeping sign

~a = -(a + 1)

int a = 5;





2^ position of bit

- int a = 5;
- In java int is 32 bit & long is 64 bit
- _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 0 0 0 0 1 0 1
- 0101

Who computer store negative no

- Hint: 2’s complement
- **Two’s complement** is a way of representing **negative numbers** in binary in computers.

  A. Invert bits [this is 1’s complement]

  B. Add 1 [final 2’s complement result]

7. Ternary Operator

condition ? value_if_true : value_if_false;

Handle Input in Java

- Scanner is a built-in Java class used to **take input from the user** (keyboard input)
- Import Scanner class
  - [**import java.util.Scanner;**]

Method of Scanner Class

📌 Common Scanner Methods

Method	Purpose	Example
`nextInt()`	Reads integer	`int a = sc.nextInt();`
`nextFloat()`	Reads float value	`float f = sc.nextFloat();`
`nextDouble()`	Reads double value	`double d = sc.nextDouble();`
`next()`	Reads one word	`String s = sc.next();`
`nextLine()`	Reads full line	`String s = sc.nextLine();`
`nextBoolean()`	true/false input	`boolean b = sc.nextBoolean();`

Control Flow

- Control flow determines the order in which statements execute in a Java program.
- Control flow are used
  - Decide which code to run
  - Repeat actions
  - Skip parts depending on conditions
- 3 types of control flow statements
  1. Decision-making statements (if-else, switch)
  2. Looping statements (for, while, do while)
  3. Branching statements (break, continue)

Develop a Calculator