

B.Sc (Prog)
Programming in JAVA
V Sem

18-8-2020

Java Variables

- **Java Is a Strongly Typed Language**
- A variable is a container which holds the value and variable is assigned with a data type
- Variable is a name of memory location. There are three types of variables in java: local, instance and static.

- all variables have a scope, which defines their visibility, and a lifetime
- all variables must be declared before they can be used. The basic form of a variable declaration is shown here:

type identifier [= value][, identifier [= value] ...];

- The *type* is one of Java's atomic types, or the name of a class or interface. The *identifier* is the name of the variable.

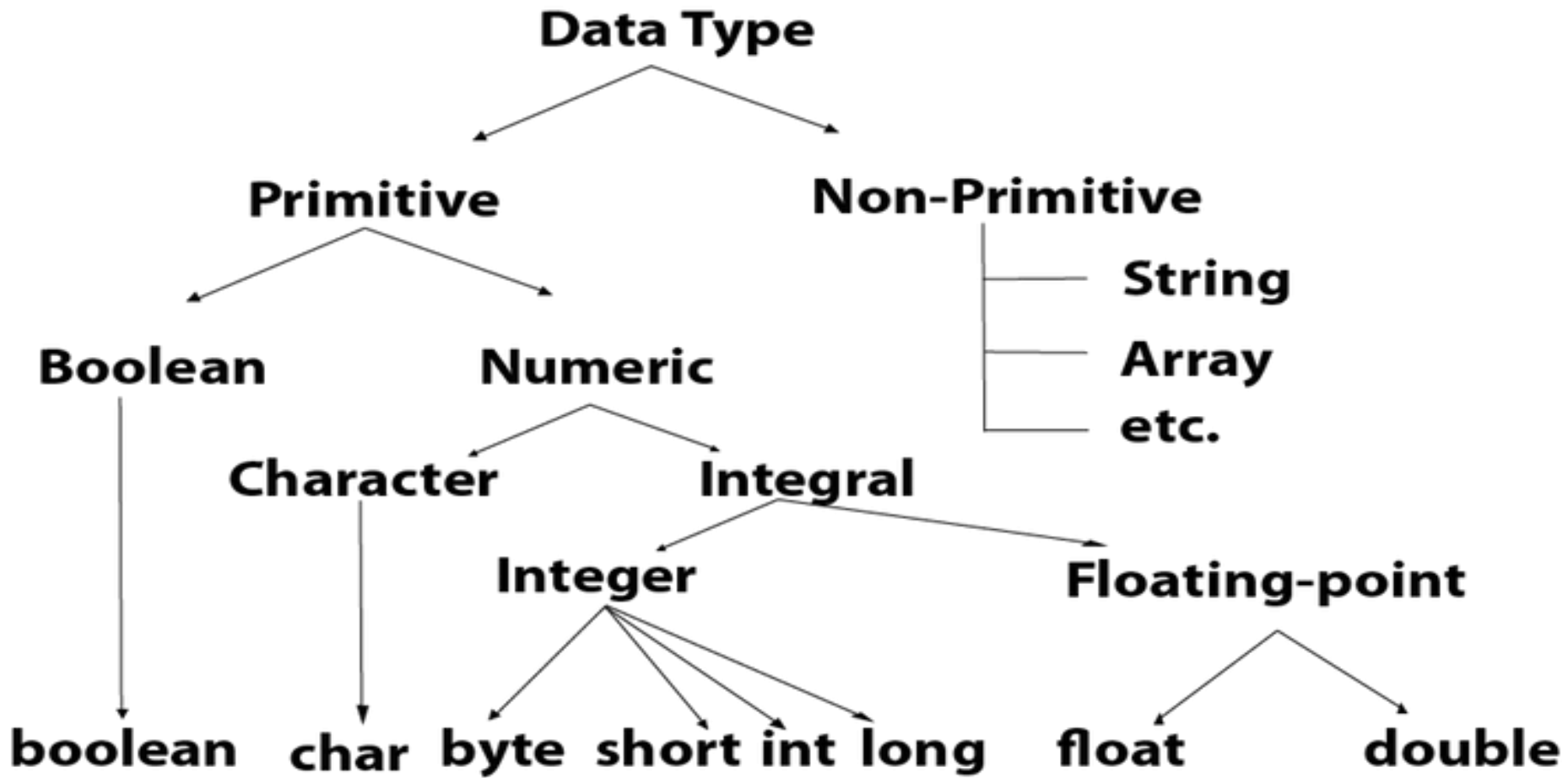
- `int a, b, c; //` declares three ints, a, b, and c.
- `int d = 3, e, f = 5; //` declares three more ints, initializing d and f.
- `byte z = 22; //` initializes z.
- `double pi = 3.14159; //` declares an approximation of pi.
- `char x = 'x'; //` the variable x has the value 'x'.

Dynamic Initialization

- Java allows variables to be initialized dynamically, using any expression valid at the time the variable is declared.

```
// Demonstrate dynamic initialization.
class DynInit {
public static void main(String args[]) {
double a = 3.0, b = 4.0;
// c is dynamically initialized
double c = Math.sqrt(a * a + b * b);
System.out.println("Hypotenuse is " + c);
}}
```

- The program uses another of Java's built-in methods, **sqrt()** which is a member of the **Math class, to compute the square root of its argument**
- initialization expression may use any element valid at the time of the initialization, including calls to methods, other variables, or literals.



Boolean Data Type

- The Boolean data type is used to store only two possible values: true and false. This data type is used for simple flags that track true/false conditions.
- The Boolean data type specifies one bit of information
- **Example:** Boolean one = false

Byte Data Type

- Its value-range lies between -128 to 127 (inclusive). Its minimum value is -128 and maximum value is 127. Its default value is 0.

String in java

- Generally, String is a sequence of characters. But in Java, string is an object that represents a sequence of characters.
- The `java.lang.String` class is used to create a string object.
- **Java String** class provides a lot of methods to perform operations on strings such as `compare()`, `concat()`, `equals()`, `split()`, `length()`, `replace()`, `compareTo()`, `intern()`, `substring()` etc.

two ways to create String object:

- By string literal

```
String s="hello";
```

- By new keyword

```
String s=new String ("hello");
```

- char charAt(int index) returns char value for the particular index
- int length() returns string length
- Int compareTo() Compares two strings lexicographically

Scanner class

- Scanner is a class in java.util package used for obtaining the input of the primitive types like int, double, etc. and strings
- STEPS: create an object of Scanner class and pass the predefined object System.in, which represents the standard input stream.

```
Scanner sc = new Scanner(System.in);
```

- To read numerical values of a certain data type XYZ, the function to use is `nextXYZ()`. For example, to read a value of type `short`, we can use `nextShort()`, `nextInt()`
- To read strings, we use `nextLine()`.
- To read a single character, we use `next().charAt(0)`. `next()` function returns the next token/word in the input as a string and `charAt(0)` function returns the first character in that string.

```
import java.util.Scanner;
public class ScannerDemo1
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        String name = sc.nextLine();
String name1="hello";

        char gender = sc.next().charAt(0);
        int age = sc.nextInt();
        long mobileNo = sc.nextLong();
        double cgpa = sc.nextDouble();

        // Print the values to check if the input was correctly obtained.
        System.out.println("Name: "+name);
        System.out.println("Gender: "+gender);
        System.out.println("Age: "+age);
        System.out.println("Mobile Number: "+mobileNo);
        System.out.println("CGPA: "+cgpa);
    }
}
```

Check your concepts...

- What are java buzzwords? Java buzzwords explain the important features of java. They are Simple, Secured, Portable, architecture neutral, high performance, dynamic, robust, interpreted etc.
- Is byte code is similar to .obj file in C? Yes, both are machine understandable codes No, .obj file directly understood by machine, byte code requires JVM

Practical Exercise

- Write a Java program that take integer as input from user then prints out all the prime numbers up to that Integer?
- Write a Java program that checks whether a given string is a palindrome or not. Ex:
MADAM is a palindrome?