# JAVA Data Types and Variables

# Data Types

There are two data types available in Java −

**Primitive Data Types**

The primitive data types include boolean, char, byte, short, int, long, float and double.

**Reference/Object Data Types**

The non-primitive data types include Classes, Interfaces, and Arrays.

Specify the type of data and the length of the data item in bytes

- int, short, long
- float, double
- boolean
- char

# Data Types

These can be put in four groups:

- Integers This group includes **byte, short, int, and long**, which are for whole-valued signed numbers.

- Floating-point numbers This group includes **float and double**, which represent numbers with fractional precision.

- Characters This group includes **char**, which represents symbols in a character set, like letters and numbers.

- Boolean This group includes boolean, which is a special type for representing **true/false** values.

# Data Types

| Reserved Word | Data Type | Size | Range of Values |
|---|---|---|---|
| byte | Byte Length Integer | 1 bytes | $-2^8$ to $2^7-1$ |
| short | Short Integer | 2 bytes | $-2^{16}$ to $2^{16}-1$ |
| int | Integer | 4 bytes | $-2^{32}$ to $2^{31}-1$ |
| long | Long Integer | 8 bytes | $-2^{64}$ to $2^{63}-1$ |
| float | Single Precision | 4 bytes | $-2^{32}$ to $2^{31}-1$ |
| double | Real number with double | 8 bytes | $-2^{64}$ to $2^{62}-1$ |
| char | Character ( 16 bit unicode ) | 2 bytes | 0 to 216-1 |
| boolean | Has value true or false | A boolean value | true or false |
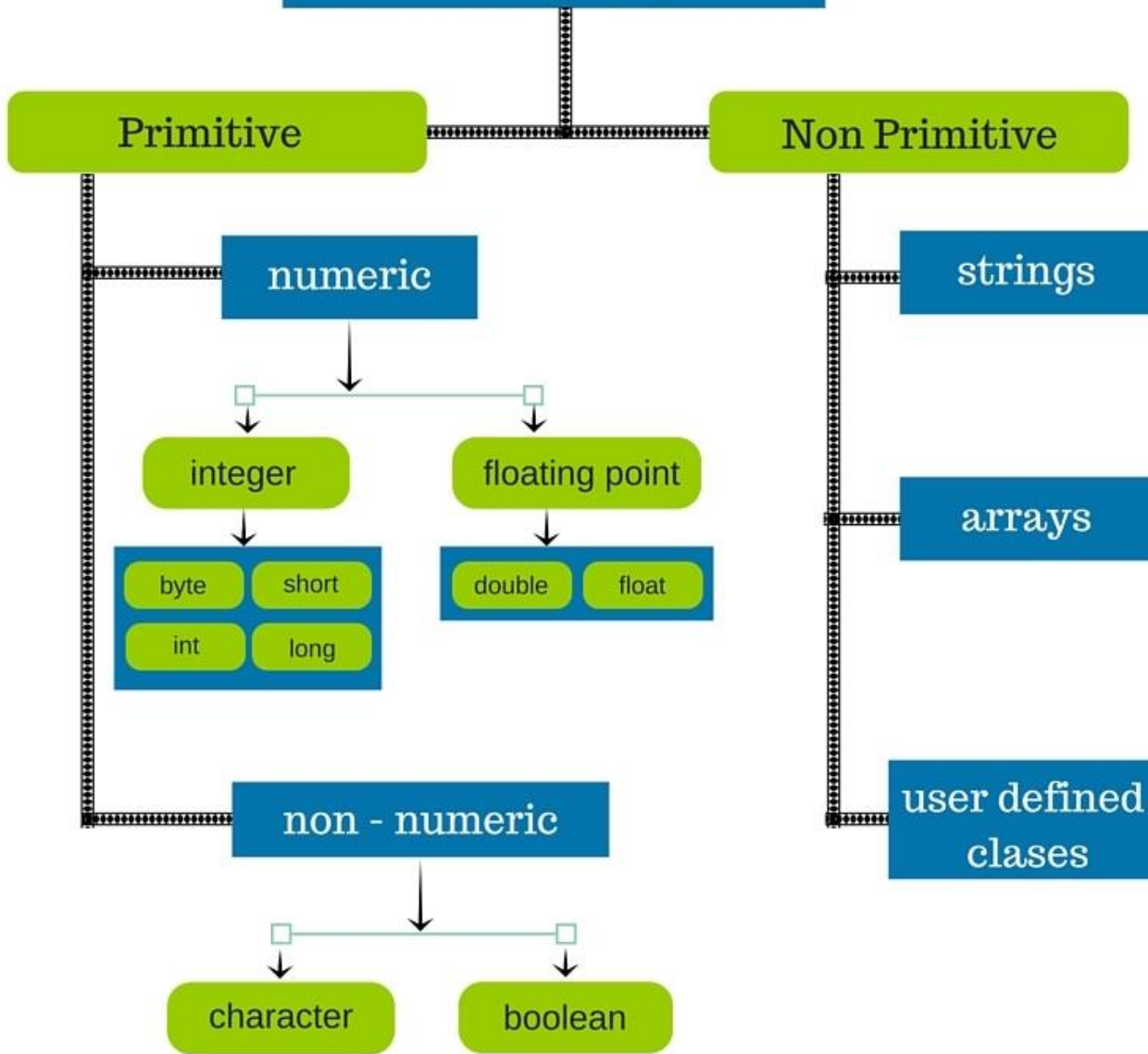
# Variables

- The variable is the basic unit of storage in a Java program. A variable is defined by the combination of an identifier, a type, and an optional initializer.

- In addition, all variables have a scope, which defines their visibility, and a lifetime.

**Declaring a Variable**

- In Java, 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 ] ...];

- Type is the data type

- Identifier is the name of variable.

# Variables

```
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'.
```