

# Java Data Types

# Different Data Types

- There are two data types available in Java:
- Primitive Data Types
  - There are eight primitive data types supported by Java. Primitive data types are predefined by the language and named by a keyword.
- Reference/Object Data Types
  - Reference variables are created using defined constructors of the classes. They are used to access objects.

# Integer datatype - Byte

- Byte data type is an **8-bit signed** two's complement integer.
- Minimum value is -128 ( $-2^7$ )
- Maximum value is 127 (inclusive) ( $2^7 - 1$ )
- Default value is 0
- Byte data type is used to save space in large arrays, mainly in place of integers, since a byte is four times smaller than an int.
- **Example: byte a = 100 , byte b = -50**

# Integer datatype - Short

- Short data type is a **16-bit signed** two's complement integer.
- Minimum value is -32,768 ( $-2^{15}$ )
- Maximum value is 32,767 (inclusive) ( $2^{15} - 1$ )
- Short data type can also be used to save memory as byte data type. A short is 2 times smaller than an int
- Default value is 0.
- **Example: short s = 10000, short r = -20000**

# Integer datatype - Int

- Int data type is a **32-bit signed** two's complement integer.
- Minimum value is - 2,147,483,648. ( $-2^{31}$ )
- Maximum value is 2,147,483,647 (inclusive). ( $2^{31}-1$ )
- Int is generally used as the default data type for integral values unless there is a concern about memory.
- The default value is 0.
- **Example: int a = 100000, int b = -200000**

# Integer datatype - Long

- Long data type is a 64-bit signed two's complement integer.
- Minimum value is -9,223,372,036,854,775,808. ( $-2^{63}$ )
- Maximum value is 9,223,372,036,854,775,807 (inclusive). ( $2^{63} - 1$ )
- This type is used when a wider range than int is needed.
- Default value is 0L.
- Example: long a = 100000L, long b = -200000L

# Float datatype - Float

- Float data type is a single-precision **32-bit** IEEE 754 floating point.
- Float is mainly used to save memory in large arrays of floating point numbers.
- Default value is 0.0f.
- Float data type is never used for precise values such as currency.
- **Example: float f1 = 234.5f**

# Float datatype - Double

- double data type is a double-precision **64-bit** IEEE 754 floating point.
- This data type is generally used as the default data type for decimal values, generally the default choice.
- Double data type should never be used for precise values such as currency.
- Default value is 0.0d.
- **Example: double d1 = 123.4**



# Character datatype - char

- char data type is a single 16-bit Unicode character.
- Minimum value is '\u0000' (or 0).
- Maximum value is '\uffff' (or 65,535 inclusive).
- Char data type is used to store any character.
- Example: `char letterA = 'A'`

# Boolean datatype - boolean

- boolean data type represents one bit of information.
- There are only two possible values: true and false.
- This data type is used for simple flags that track true/false conditions.
- Default value is false.
- Example: `boolean one = true`

# Reference datatype

- Class objects, and various type of array variables come under reference data type.
- Default value of any reference variable is null.
- A reference variable can be used to refer to any object of the declared type or any compatible type.
- Example: `Animal animal = new Animal("giraffe");`

# Java Scanner Class

- There are various ways to read input from the keyboard, the `java.util.Scanner` class is one of them.
- The **Java Scanner** class breaks the input into tokens using a `delimiter that is whitespace` by default. It provides many methods to read and parse various primitive values.
- Java Scanner class is widely used to parse text for string and primitive types using regular expression.

# Methods of Scanner Class

<code>public byte nextByte()</code>	it scans the next token as a byte.
<code>public short nextShort()</code>	it scans the next token as a short value.
<code>public int nextInt()</code>	it scans the next token as an int value.
<code>public long nextLong()</code>	it scans the next token as a long value.
<code>public float nextFloat()</code>	it scans the next token as a float value.
<code>public double nextDouble()</code>	it scans the next token as a double value.