

# Variables

- A variable is a location in the memory that has a name and contains a value. The value could be integer, float, or a character.

## Naming Variables in Java

The following rules are used for naming variables in Java :

- A variable name must begin with a letter, an underscore (\_), or the dollar symbol (\$), which can be followed by a sequence of letters or digits (0 to 9), '\$', or '\_' .
- Should not contain any embedded spaces or symbols. However, an underscore can be used wherever a space is required, like high\_score.

- Must be unique.
- Uppercase letters are considered distinct from lowercase letters
- Can have any number of characters.
- Reserved Keywords cannot be used as variable names.

## Data Types in Java

- Data type specifies the size and type of values that can be stored in a variable.
- A variable is associated with a data type.
- Data types in Java are classified into two types:
  - Primitive — which include Integer, Character, Boolean, and Floating Point.
  - Non-primitive (Reference) — which include Classes, Interfaces, and Arrays.

# Primitive Data Types

## Integer

Type	Size (in bytes)	Range	Default Value
byte	1	-128 to 127	0
short	2	-32768 to 32767	0
int	4	-2147483648 to 2147483647	0
long	8	-9223372036854775808 to 9223372036854775807	0

# Primitive Data Types

## Floating Point

Type	Size (in bytes)	Range	Default Value
float	4	$3.4e-038$ to $3.4e+038$	0.0f
double	8	$1.7e-308$ to $1.7e+038$	0.0d

# Primitive Data Types

## Character

- The char type is a Unicode character, as defined by the Unicode Standard
- It has a minimum value of '\u0000' (or 0) and a maximum value of '\uffff' (or 65,535, inclusive).

Type	Size (in bytes)	Range	Default Value
char	2	0 to 65535	'\u0000'

## Boolean

Type	Size (in bits)	Range	Default Value
boolean	1	true or false	false

Reference Type	Primitive Type
It is not pre-defined except the String.	It is pre-defined in Java.
All reference type begins with Uppercase letter.	All primitive type begins with a lowercase letter.
Non-primitive types have all the same size.	The size of a primitive type depends on the data type.
It is used to invoke or call methods.	We cannot invoke the method with a primitive type.
It can be null.	It cannot be null. It always has value.
Examples of reference data types are class, Arrays, String, Interface, etc.	Examples of primitive data types are int, float, double, Boolean, long, etc.
JVM allocates 8 bytes for each reference variable, by default.	Its size depends on the data type.
<b>Example:</b> Demo d1;	<b>Example:</b> int num=78;