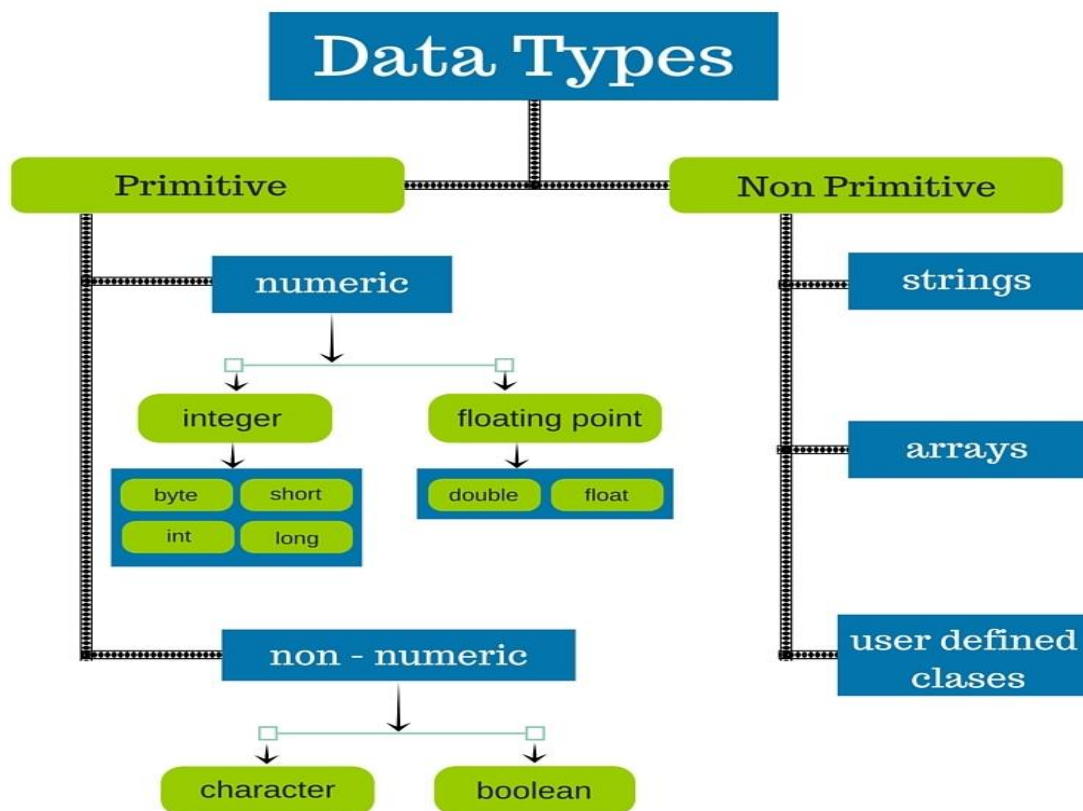


Data types

Data type is a special type of keyword which is useful for allocating sufficient memory for that data. Data types specify the different sizes and values that can be stored in the variable. There are two types of data types in Java:

1. **Primitive data types:** The primitive data types include boolean, char, byte, short, int, long, float and double.
2. **Non-primitive data types:** The non-primitive data types include Classes, Interfaces, and Arrays.



There are 8 types of primitive data types:->

| Data Type | Size | Description |
|-----------|---------|---|
| byte | 1 byte | Stores whole numbers from -128 to 127. |
| short | 2 bytes | Stores whole numbers from -32,768 to 32,767. |
| int | 4 bytes | Stores whole numbers from -2,147,483,648 to 2,147,483,647. |
| long | 8 bytes | Stores whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807. |
| float | 4 bytes | Stores fractional numbers. Sufficient for storing 6 to 7 decimal digits. |
| double | 8 bytes | Stores fractional numbers. Sufficient for storing 15 decimal. digits |
| boolean | 1 bit | Stores true or false values. |
| char | 2 bytes | Stores a single character/letter or Unicode value. (lowest value:\u0000 or(0) highest value:\uFFFF or(65,535)) |

java Variable

A variable is a container which holds the value while the java programs is executed. A variable is assigned with a data type. Variables is a name of memory location.

Syntax:->

```
<data_type> <variable_name>;
```

Ex->

- a. `int myNum=10; //(by default value is 0)`
- b. `float myFloatnum=10.5f; //(by default value is 0.0f)`
- c. `char myLetter='A';// (by default value is '\u0000')`
- d. `boolean myBool=true; //(by default value is false)`
- e. `long myLong=10.55L; //(by default value is 0.0L)`
- f. `double myDouble=10.55d;// (by default value is 0.0d)`

There are three types of variables in java:->

1.Local variable

2.Instance variable

3.Static variable

1.Local variable:->

A variable declared inside the body of the method is called local variable. You can use this variable only within that method and the other methods in the class aren't even aware that the variable exists. A local variable cannot be defined with "static" keyword.

2.Instance variable:

A variable declared inside the class but outside the body of the method, is called instance variable. It is not declared as static. It is called instance variable because its value is instance specific and is not shared among instances.

3.Static variable:

A variable which is declared as static is called static variable. It cannot be local. You can create a single copy of static variable and share among all the instances of the class. Memory allocation for static variable happens only once when the class is loaded in the memory.

Declaration of local,instance and static:->

```
class Num
{
    int a=10;//instance variable
    static int b=100;//static variable
    void fun()
    {
        int c=100;//local variable
    }
}
```

The general rules for constructing names for variables (unique identifiers) are:

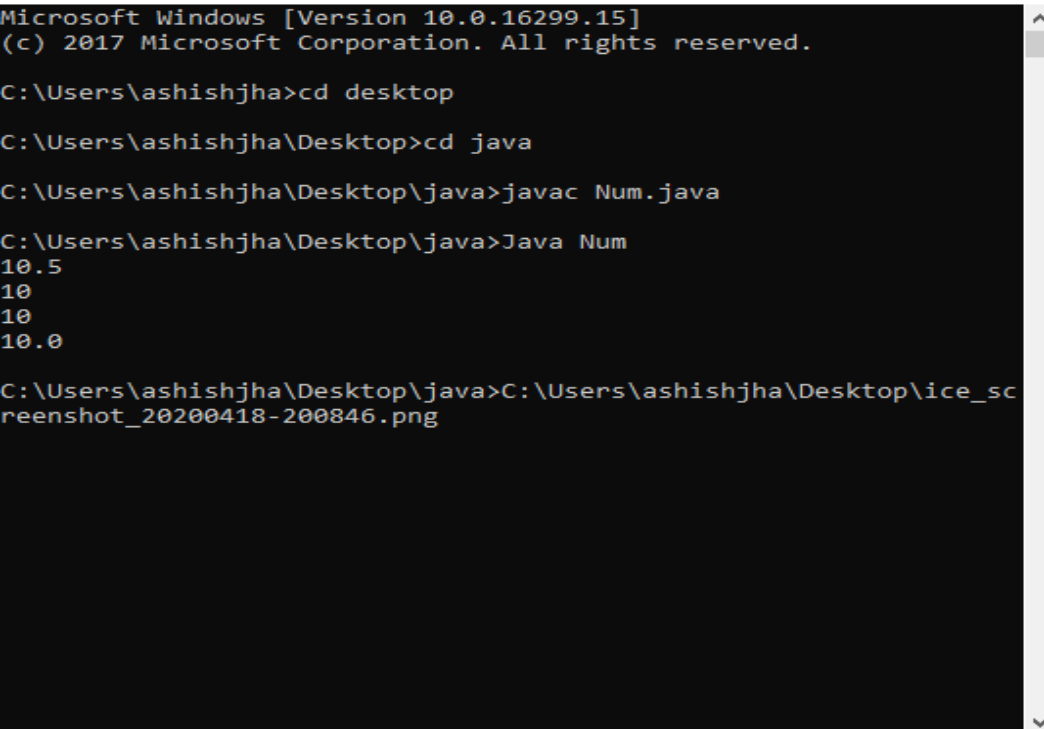
- Names can contain letters, digits, underscores, and dollar signs.
- Names must begin with a letter.
- Names should start with a lowercase letter and it cannot contain whitespace
- Names can also begin with \$ and _ (but we will not use it in this tutorial).
- Names are case sensitive ("myVar" and "myvar" are different variables).
- Reserved words (like Java keywords, such as int or float) cannot be used as names.

Example:

Java variable Narrowing(Typecasting) and Widening

```
class Num
{
    public static void main(String args[])
    {
        float i=10.5f;
```

```
//int j=i;//compile time error  
int j=(int)i;//type casting  
System.out.println(i);  
System.out.println(j);  
int a=10;  
float b=a;//widening  
System.out.println(a);  
System.out.println(b);  
}  
  
}
```



```
Command Prompt  
Microsoft Windows [Version 10.0.16299.15]  
(c) 2017 Microsoft Corporation. All rights reserved.  
  
C:\Users\ashishjha>cd desktop  
  
C:\Users\ashishjha\Desktop>cd java  
  
C:\Users\ashishjha\Desktop\java>javac Num.java  
  
C:\Users\ashishjha\Desktop\java>Java Num  
10.5  
10  
10  
10.0  
  
C:\Users\ashishjha\Desktop\java>C:\Users\ashishjha\Desktop\ice_screenshot_20200418-200846.png
```