**Data Types:**

Data types define the values that a variable can take.

**byte**, **short**, **int** and **long** data types are used for storing whole numbers.

**float** and **double** are used for fractional numbers.

**char** is used for storing characters(letters).

**boolean** data type is used for variables that holds either true or false.

Byte can store the whole number between -128 and 127

Short can store the whole number between -32,768 to 32767

Int can store the whole number between -2,147,483,648 to 2,147,483,647

Long can store the whole number between -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807

Double can store 15 decimal digits

Float can store 6 to 7 decimal digits

Boolean holds either true or false

Char holds characters.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Types** | **Size (bytes)** | **Minimum Value** | **Maximum Value** | **Precision** |
| byte | 1 | -128 | 127 | From +127 to -128 |
| short | 2 | -215 | 215-1 | From +32,767 to -32,768 |
| int | 4 | -231 | 231-1 | From +2,147,483,647 to -2,147,483,648 |
| long | 8 | -263 | 263-1 | From +9,223,372,036,854,775,807 to -9,223,372,036,854,775,808 |
| float | 4 | 2-149 | (2-2-23)·2127 | From 3.402,823,5 E+38 to 1.4 E-45 |
| double | 8 | 2-1074 | (2-2-52)·21023 | From 1.797,693,134,862,315,7 E+308 to 4.9 E-324 |
| char | 2 | 0 | 216-1 | All Unicode characters |

Example:

**package** FPPackage;

**public** **class** variablesex {

**public** **static** **void** main(String[] args) {

**byte** a = 9;

**int** b = 20;

**char** c1 = 'j';

System.***out***.println("a value is "+a);

System.***out***.println("b value is "+b);

System.***out***.println("C1 is "+c1);

**int** c = a \* b;

System.***out***.println("c value is "+c);

}

}

**Primitive Casting in JAVA:**

Primitive casting is used to convert primitive values from one data type to another data type. For example, an int value can be assigned to a float value, a double value can be assigned to an int value etc.

If we are assigning a small data type value to a large data type value no casting is needed. But if we are assigning a large data type value to a small data type value casting is needed.

Example:

Short takes 2 bytes in memory and int takes 4 bytes in memory. We can assign a short value to an int but for assigning an int value to a short we have to cast it.

**public** **class** JavaExamples {

**static** **short** *a* = 1;

**static** **int** *b*;

**static** **int** *c* = 2;

**static** **short** *d*;

**public** **static** **void** main(String[] args) {

*b* = *a*;

System.***out***.println("b value is "+*b*);

//d = c; //Error Can not convert from int to short

*d* = (**short**) *c*;

System.***out***.println("d value is "+*d*);

}

}