

University of the Armed Forces ESPE

Object-oriented programming

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What is a primitive data type?

The primitive data types in java are those defined by the particular language, that's why they are called primitives, in some way they are the most basic data types allowed. These types of data are as follows

Primitive data in Java

In Java there are eight primitive data types that can be identified as :

C har

In java, the primitive data type char stores a specific character , as mentioned before, included in ASCII code . To denote a character in java, we put the symbol in single quotes, like this: 'a' '+' '@'

B oolean

boolean represents a logical result, as we saw, this is true or false, to create a variable with a boolean value in java we do the following:

```
boolean variableName = true;
```

B yte

The byte type stores an integer between -128 to 127, it **helps** us to use little memory in variables that will not actually change to numbers greater than these, such as menu options. To use it we write

```
byte variableName = 28; // a value between -128 and 127
```

I nt

The int type is the most common type among programmers, since it has a range between -2,147,483,648 to 2,147,483,647, which is quite wide, in addition to using only 4 bytes of memory, thanks to this balance it is the type of data that most it is used, for its large range and moderate memory. To use it we write:

```
int variableName = 231231; // number within the range -2,147,483,648 to 2,147,483,647
```

Long

The primitive data type integer 's largest java, this number comprises between - 9,223,372,036,854,775,808 to 9,223,372,036,854,775,807, widely used in fields scientists and mathematicians because of its broad numerical range. To make use of this, we write:

```
long variableName = 102323; // number within the range -  
9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
```

Float

This data type allows an accuracy of about 7 decimal, and includes values $3.40282347 \times 10^{38}$ to $1.40239846 \times 10^{-45}$, when out of the range of 7 decimal begins to lose the accuracy of the calculated values. To use it we use:

```
float variableName = 2.9f;
```

As we can see, the f is put at the end of the assignment to refer to what is a floating data type, if we omit it, java will interpret it as double and send us an error.

Double

The double type gives us an approximate precision of 16 decimal places, within the range $1.7976931348623157 \times 10^{308}$ to $4.9406564584124654 \times 10^{-324}$, when we go beyond 16 decimal places, the precision is diminished and we can lose veracity in the results. To make use of a double we write:

```
double = variableName = 10.2423; // a number in the range  
1.7976931348623157x10 ^ 308 to 4.9406564584124654x10 ^ 324
```

- Integer **numbers** (**byte** , **short** , **int** , **long**).
- Real numbers (**float** , **double**).
- Character (**char**).
- Boolean or logical (**boolean**) : The type **boolean** which can only be **true** or **false** and

List of primitive data types in Java			
<i>Kind</i>	<i>Size</i>	<i>Lower limit</i>	<i>Upper limit</i>
byte	8 bits	-128	127

List of primitive data types in Java			
<i>Kind</i>	<i>Size</i>	<i>Lower limit</i>	<i>Upper limit</i>
shorts	16 bit	-32768	32767
int	32 bit	-2147483648	2147483647
long	64 bit	-9223372036854775808	9223372036854775807
float	32 bit	-3.402823e38	3.402823e38
double	64 bit	-1.79769313486232e308	1.79769313486232e308
char	16 bit	'\ u0000'	'\ uffff '

Primitive data in Python

Python has **four primitive types**: integers, floats, booleans and strings or strings .

- The integer variable types in Python (`int`) are used to represent numeric data, specifically integers. These can be both positive and negative.

```
year = 2021
```

```
day = 7
```

```
age = 26
```

```
temperature = -5
```

```
angle = -45
```

- Python floating data types (`float`) are used to represent decimal or floating point numbers.

```
pi = 3.1416
```

```
height = 1.84
```

```
weight = 85.6
```

```
temperature = -5.55
```

```
age = 26.0
```

- Boolean primitive types in python (`bool`) are types of binary data, ie they can take the values: *True* (**True**) and *False* (**False**). They are useful for expressions with conditionals and comparisons.

```
this_cold = True
```

```
is_low = False
```

- The String data types in Python are an array of characters that form strings to generally form a message or sentence. They can be created using single, double or triple quotes.

```
teacher = " Javier Morales "
```

```
web = 'Automatic Education Control'
```

```
courses = "" "
```

```
1. Python
```

```
2. Matlab
```

```
3. MicroPython
```

```
4. Arduino
```

```
5. PIC
```

```
6. Process Control
```

```
"" "
```

Links:

- <https://computandocodigo.wordpress.com/2019/03/03/tipos-de-datos-primitiva-en-java/>
- <https://controlautomaticoeducacion.com/python-desde-cero/tipos-de-datos/>
- <https://controlautomaticoeducacion.com/python-desde-cero/tipos-de-datos/#:~:text=Python%20tiene%20cuatro%20tipos%20primitives%3A%20enteros%2C%20flotantes%2C%20booleanos,ser%20both%20positive%20and%20negative.%20year%20%3D%202021>
- http://ocw.upm.es/pluginfile.php/1037/mod_label/intro/3-tiposprimitivadedato.pdf