

Estructura de datos y algoritmos

Rodrigo Alvarez

rodrigo.alvarez2@mail_udp.cl

Que es java?

Que es java?



Que es java?

- Desarrollado por Sun Microsystems
- Lanzado en 1995
- Actualmente propiedad de Oracle
- Open Source



Que es java?

- Lenguaje compilado a bytecode
(corre encima de la jvm)
- Fuertemente orientado a objetos
- Sintaxis similar a C++
- Multiplataforma



Domina todos lenguajes de programación estudiando en EDteam

ed.team/cursos



MAJOR COMPANIES THAT USE



Hello world

Java Hello World JAVA ▾ RUN ►

```
1
```

STDIN Input for the program (Optional)

Output:

Click on RUN button to see the output

Tipo dato	Tamaño	Descripción
byte	1 byte	números del -128 al 127
short	2 bytes	-32,768 al 32,767
int	4 bytes	-2,147,483,648 al 2,147,483,647
long	8 bytes	-9,223,372,036,854,775,808 al 9,223,372,036,854,775,807
float	4 bytes	números racionales, hasta 7 dígitos decimales
double	8 bytes	hasta 15 dígitos decimales
boolean	1 bit (?)	true o false
char	2 bytes	un único carácter

especificación tamaños

Operadores aritméticos

Operator	Name	Description	Example
+	Addition	Adds together two values	x + y
-	Subtraction	Subtracts one value from another	x - y
*	Multiplication	Multiplies two values	x * y
/	Division	Divides one value by another	x / y
%	Modulus	Returns the division remainder	x % y
++	Increment	Increases the value of a variable by 1	++x
--	Decrement	Decreases the value of a variable by 1	--x

Operadores de asignación

Operator	Example	Same As
=	x = 5	x = 5
+=	x += 3	x = x + 3
-=	x -= 3	x = x - 3
*=	x *= 3	x = x * 3
/=	x /= 3	x = x / 3
%=	x %= 3	x = x % 3

Operadores de comparación

Operator	Name	Example
<code>==</code>	Equal to	<code>x == y</code>
<code>!=</code>	Not equal	<code>x != y</code>
<code>></code>	Greater than	<code>x > y</code>
<code><</code>	Less than	<code>x < y</code>
<code>>=</code>	Greater than or equal to	<code>x >= y</code>
<code><=</code>	Less than or equal to	<code>x <= y</code>

Operadores lógicos

Operator	Name	Description	Example
&&	Logical and	true if both statements are true	<code>x < 5 && x < 10</code>
	Logical or	true if one of the statements is true	<code>x < 5 x < 4</code>
!	Logical not	Reverse the result	<code>!(x < 5 && x < 10)</code>

I/O: Input/Output en java

427p45t7h

JAVA ▾ RUN ►

```
1
```

STDIN

```
2 3
```

Output:

```
Ingresá dos ints:  
el primer numero es: 2  
el segundo numero es: 3  
La suma de los numeros es: 5
```

Scanner class

La clase `Scanner` se utiliza para obtener la entrada del usuario, y es parte del paquete `java.util`.

Method	Description
<code>nextBoolean()</code>	Reads a <code>boolean</code> value from the user
<code>nextByte()</code>	Reads a <code>byte</code> value from the user
<code>nextDouble()</code>	Reads a <code>double</code> value from the user
<code>nextFloat()</code>	Reads a <code>float</code> value from the user
<code>nextInt()</code>	Reads a <code>int</code> value from the user
<code>nextLine()</code>	Reads a <code>String</code> value from the user
<code>nextLong()</code>	Reads a <code>long</code> value from the user

Scanner

The screenshot shows a Java code editor interface. At the top right are two buttons: "JAVA ▾" and a pink "RUN ▶" button. The code area contains the following Java code:

```
427nv54rs
1
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Ingrese una palabra");
        String palabra = scanner.nextLine();
        System.out.println("La palabra ingresada es: " + palabra);
        System.out.println("Ingrese un numero");
        int numero = scanner.nextInt();
        System.out.println("El numero ingresado es: " + numero);
        System.out.println("Ingrese un numero flotante");
        double numeroFlotante = scanner.nextDouble();
        System.out.println("El numero flotante ingresado es: " + numeroFlotante);
    }
}
```

Below the code, there are two sections: "STDIN" and "Output". The "STDIN" section contains the input "hola". The "Output" section contains the program's response:

Output:
Ingrese una palabra
La palabra ingresada es: hola
Ingrese un numero
El numero ingresado es: 3
Ingrese un numero flotante
El numero flotante ingresado es: 3.14

if, else, while, for

427nvkqmd

JAVA ▾ RUN ▶

```
1
STDIN
17
```

Output:

```
the number is odd
numeros pares:
2
4
6
8
10
12
14
16
```

Strings

The screenshot shows a Java code editor interface. At the top right are two buttons: "JAVA ▾" and "RUN ▶". The code area contains the following Java code:

```
1 public class Main {  
2     public static void main(String[] args) {  
3         String str = "Hello World";  
4         System.out.println(str);  
5     }  
6 }
```

The output window below the code shows the following text:

427nu2xbm
STDIN
23
Output:
H
e
l
l
o
W
o
r
l

String methods

Arrays

427p4c9xn

JAVA ▾ RUN ►

1

STDIN

Input for the program (Optional)

Output:

4

Métodos

```
[modificador de acceso] [tipo_retorno] nombre_funcion(tipo_1 parametro_1, tipo_2 parametro_2, ...){  
    // instrucciones  
    return valor;  
}
```

Métodos

A screenshot of a Java code editor interface. At the top right, there are two buttons: "JAVA ▾" and a pink "RUN ▶" button. Below these buttons, the text "427p5fbvj" is displayed. To the left of the code area, the number "1" is shown. The code area contains the following Java code:

```
1
```

Below the code area, the word "STDIN" is displayed. Underneath "STDIN", there is a placeholder text "Input for the program (Optional)". Further down, the word "Output:" is followed by the text "hi!".

Clases

A screenshot of a Java code editor interface. At the top right, there are two buttons: "JAVA ▾" and a pink "RUN ▶" button. Below these buttons, the text "427pmavjh" is displayed. On the left side of the editor, the number "1" is visible, indicating the line number of the current code line. In the center of the editor, the word "STDIN" is shown. Below the editor area, there is a text input field labeled "Input for the program (Optional)". Underneath the input field, the word "Output:" is followed by the text "miauuuu".

Herencia

A screenshot of a Java code editor interface. At the top right, there are two buttons: "JAVA ▾" and a pink "RUN ▶" button. Below these buttons, the text "427pqr5m" is displayed. In the center, the number "1" is shown above a blank white area where code would typically be written. To the right of this area, the word "STDIN" is followed by a text input field containing the placeholder "Input for the program (Optional)". Below this, the word "Output:" is followed by the text "Tuut, tuut!" on one line and "Ford 2023 4" on the next line.

```
427pqr5m
1
STDIN
Input for the program (Optional)
Output:
Tuut, tuut!
Ford 2023 4
```

Interfaces

Las interfaces en Java son una colección de métodos abstractos y constantes que pueden ser implementados por cualquier clase que las implemente.

Una interfaz define un conjunto de métodos y su firma, pero no proporciona implementaciones de los métodos.

Interfaces

427pruj44

JAVA ▾ RUN ►

1

STDIN

Input for the program (Optional)

Output:

The pig says: wee wee
Zzz

Generics

A screenshot of a Java code editor interface. At the top right, there are two buttons: "JAVA ▾" and a pink "RUN ▶" button. Below the buttons, the text "427psdcfw" is displayed. In the main editor area, the number "1" is visible on the left. To the right of the editor, the word "STDIN" is displayed above a text input field labeled "Input for the program (Optional)". Below the input field, the word "Output:" is followed by the number "3".

```
1
427psdcfw
STDIN
Input for the program ( Optional )
Output:
3
```

- `ArrayList`: Implementa un **TDA List** en array manipulando el tamaño de forma dinámica.
- `LinkedList`: Implementa un **TDA List** sobre una lista de nodos.
- `Queue`: Implementa un **TDA FIFO** en una lista de nodos.
- `Stack`: Implementa un **TDA LIFO** en una lista de nodos.
- `Map`: Implementa una estructura **TDA key-value** en un árbol o una tabla hash.
- `Set`: Implementa una estructura **TDA unique value** en un árbol o una tabla hash.

