Introducción a Java

Tecnología de Programación

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Hello World

C++

```cpp
#include <iostream>

using namespace std;

int main()
{
  cout << "Hello, World !!" << endl;

  return 0;
}
```

```
> g++ -o hello hello.cc ↵
> hello ↵
```

Java

```java
public class hello
{
  public static void main(String[] args)
  {
    System.out.println("Hello, World !!");
  }
}
```

```
> javac hello.java ↵
> java hello ↵
```

Entrada/Salida

C++

```cpp
#include <string>
#include <iostream>

using namespace std;

int main(int argc,char* argv[])
{
  string  name;
  int   age;

  cout << "What's your name ? " << flush;
  cin >> name;
  cout << "What's your age ? " << flush;
  cin >> age;
  cout << "Hello, " << name << " !!" << endl;
  cout << "You're " << age << " years old" << endl;

  return 0;
}
```

Java

```java
import java.util.Scanner;

public class tst
{
  public static void main(String[] args)
  {
    String  name = new String();
    int   age;

    Scanner scanner = new Scanner(System.in);

    System.out.print("What's your name ? ");
    System.out.flush();
    name = scanner.next();
    System.out.print("What's your age ? ");
    System.out.flush();
    age = scanner.nextInt();
    System.out.println("Hello, "+name+" !!");
    System.out.println("You're "+age+" years old");
  }
}
```

Clases

Declaración mínima de una **clase**.

C++

```cpp
class T
{
};

int main()
{
  int age;
  T   t;

  return 0;
}
```

Java

```java
class T
{
}

public class tst
{
  public static void main(String[] args)
  {
    int age;
    T   t = new T();
  }
}
```

Clases

O bien...

C++

```cpp
class T
{
};

int main()
{
  int age;
  T*  t = new T();

  delete t;

  return 0;
}
```

Java

```java
class T
{
}

public class tst
{
  public static void main(String[] args)
  {
    int age;
    T   t = new T();
  }
}
```

Atributos

C++

```cpp
#include <iostream>

class T
{
public:
  int age;
};

int main(int argc, char** argv)
{
  T  t;
  t.age = 10;
  std::cout << t.age << std::endl;
  return 0;
}
```

Java

```java
class T
{
   public int age;
}

public class tst
{
  public static void main(String[] args)
  {
    T   t = new T();
    t.age = 10;
    System.out.println(t.age);
  }
}
```

Clases

O bien...

C++

```cpp
#include <iostream>

class T
{
public:
  int age;
};

int main(int argc, char** argv)
{
  T* t = new T();
  t->age = 10;
  std::cout << t->age << std::endl;
  delete t;
  return 0;
}
```

Java

```java
class T
{
   public int age;
}

public class tst
{
  public static void main(String[] args)
  {
    T   t = new T();
    t.age = 10;
    System.out.println(t.age);
  }
}
```

Clases

Métodos

C++

```cpp
class T
{
private:
  int age;
public:
  void set_age(int age)
    { this->age = age; }
  int  get_age() const
    { return age; }
};

int main(int argc, char** argv)
{
  T  t;
  t.set_age(10);
  std::cout << t.get_age() << std::endl;
  return 0;
}
```

Java

```java
class T
{
   private int  age;
   public  void set_age(int age)
     { this.age = age; }
   public  int  get_age()
     { return age; }
}

public class tst
{
  public static void main(String[] args)
  {
    T t = new T();
    t.set_age(10);
    System.out.println(t.get_age());
  }
}
```

Clases

O bien...

C++

```cpp
class T
{
private:
  int age;
public:
  void set_age(int age)
    { this->age = age; }
  int  get_age() const
    { return age; }
};

int main(int argc, char** argv)
{
  T* t = new T();
  t->set_age(10);
  std::cout << t->get_age() << std::endl;
  delete t;
  return 0;
}
```

Java

```java
class T
{
   private int  age;
   public  void set_age(int age)
     { this.age = age; }
   public  int  get_age()
     { return age; }
}

public class tst
{
  public static void main(String[] args)
  {
    T t = new T();
    t.set_age(10);
    System.out.println(t.get_age());
  }
}
```

Clases

Constructores

C++

```cpp
class T
{
private:
  int age;
public:
  T(int _age) : age(_age) { }
  int  get_age() const { return age; }
};

int main(int argc, char** argv)
{
  T  t(10);
  std::cout << t.get_age() << std::endl;

  return 0;
}
```

Java

```java
class T
{
   private int  age;
   public  T(int age) { this.age = age; }
   public  int get_age() { return this.age; }
}

public class tst
{
  public static void main(String[] args)
  {
    T t = new T(10);
    System.out.println(t.get_age());
  }
}
```

Clases

O bien...

C++

```cpp
class T
{
private:
  int age;
public:
  T(int _age) : age(_age) { }
  int  get_age() const { return age; }
};

int main(int argc, char** argv)
{
  T* t = new T(10);
  std::cout << t->get_age() << std::endl;

  delete t;

  return 0;
}
```

Java

```java
class T
{
   private int  age;
   public  T(int age) { this.age = age; }
   public  int get_age() { return this.age; }
}

public class tst
{
  public static void main(String[] args)
  {
    T t = new T(10);
    System.out.println(t.get_age());
  }
}
```

Clases

¿Funciona esto?

C++

```cpp
class T { ... }

class U {
private:
  T* t;
public:
  U(int age) : t(new T(age)) { }
  int get_age() const { return t->age; }
};

int main(int argc, char** argv)
{
  U* u = new U(10);
  std::cout << u->get_age() << std::endl;
  delete u;
  return 0;
}
```

Java

```java
class T { ... }

class U {
   private T t;
   public U(int age) { t = new T(age); }
   public int get_age() { return t.age; }
}

public class tst
{
  public static void main(String[] args)
  {
    U u = new U(10);
    System.out.println(u.get_age());
  }
}
```

Destructores

C++

```cpp
class T { ... };

class U {
private:
  T* t;
public:
  U(int age) : t(new T(age)) { }
  ~U() { delete t; }

  int get_age() const { return t->age; }
};

int main(int argc, char** argv)
{
  U* u = new U(10);
  std::cout << u->get_age() << std::endl;
  delete u;
  return 0;
}
```

Java

```java
class T { ... }

class U {
   private  T t;
   public U(int age) { t = new T(age); }
   public int get_age() { return t.age; }
}

public class tst
{
  public static void main(String[] args)
  {
    U u = new U(10);
    System.out.println(u.get_age());
  }
}
```

Destructores

¿Funciona esto?

C++

```cpp
class T { ... }

class U {
private:
  T* t;
public:
  U(T* _t) : t(_t) { }
  ~U() { delete t; }

  int get_age() const { return t->age; }
};

int main(int argc, char** argv)
{
  T* t = new T(10);
  U* u = new U(t);
  std::cout << u->get_age() << std::endl;
  delete t;
  delete u;
  return 0;
}
```

Java

```java
class T { ... }

class U {
   private  T t;
   public U(T t)
   {  this.t = t; }
   public int get_age() { return t.age; }
}

public class tst
{
  public static void main(String[] args)
  {
    T t = new T(10);
    U u = new U(t);
    System.out.println(u.get_age());
  }
}
```

Clases

Gestión automática de memoria dinámica, mediante *recolección de basura* (*garbage collection*)

C++

NO

Java

SÍ

Clases

Gestión automática de memoria dinámica,

C++

NO

Java

SÍ

¿ Seguro ?

Punteros inteligentes (*smart pointers*)

C++11

```cpp
#include <memory>

class T { ... }

class U {
private:
  shared_ptr<T> t;
public:
  U(shared_ptr<T> _t) : t(_t) { }
  int get_age() const { return t->age; }
};

int main(int argc, char** argv)
{
  shared_ptr<T> t = make_shared<T>(10);
  unique_ptr<U> u = make_unique<U>(t);

  cout << u->get_age() << endl;

  return 0;
}
```

Java

```java
class T { ... }

class U {
   private  T t;
   public U(T t) { this.t = t; }
   public int get_age() { return t.age; }
}

public class tst
{
  public static void main(String[] args)
  {
    T t = new T(10);
    U u = new U(t);
    System.out.println(u.get_age());
  }
}
```

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