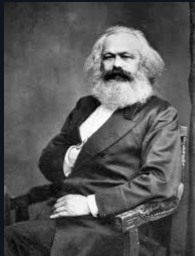# Clases & instances

Mitsiu Alejandro Carreño Sarabia

Class struggle is inevitable in Object Oriented Programming

-Karl Marx

Agenda

```
├── Recap
├── Instances
├── Class vs Instances
├── Real world instances
│   ├── Physical World
│   ├── Animated media
│   └── Software
└── Glossary
```

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1. We create a custom (user-defined) data type:
   ◦ **class Marker**

2. We bind several marker properties (attributes/instance variables)
   into our Marker object:
   ◦ **String nombreColor;**
   ◦ **short nivelTinta;**

Marker
~nivelTinta : short
~nombreColor : String

```
1  class Marker {
2      String nombreColor;
3      short nivelTinta;
4  }
5  class E11IntroPoo {
6      public static void main(String[] args) {
7          Marker marcadorBlanco = new Marker(); // <----
8          marcadorBlanco.nombreColor="Blanco";
9          marcadorBlanco.nivelTinta=100;
10     }
11 }
```

🟧 Instances

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`<tipoDato> <nombreVariable> = new <tipoDato>();`

> **new**
> A Java keyword used to create an instance of a class.

```java
1 class Marker {  // <------
2     ...
3 }
4 class E11IntroPoo {
5     public static void main(String[] args) {
6         Marker marcadorBlanco = new Marker(); // <----
7         ...
8     }
9 }
```

🟨 Instances

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Create a variable based on a class is known as an object or an instance, the verb is instantiate.

```java
1 class Marker {  // <------
2     ...
3 }
4 class E11IntroPoo {
5     public static void main(String[] args) {
6         Marker marcadorBlanco = new Marker(); // <----
7         ...
8     }
9 }
```
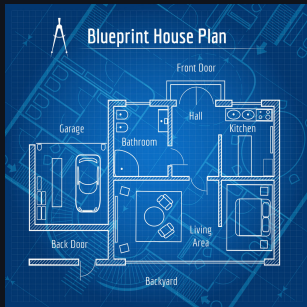
Instances

```
<tipoDato> <nombreVariable> = new <tipoDato>();
```

> **new**
> A Java keyword used to create an instance of a class.

> **instance**
> An object of a particular class. In programs written in the Java programming language, an instance of a class is created using the new operator followed by the class name.

Class vs Instance

Is this a house?

Is this a house?

What's a blueprint usefull for?

Class vs Instance

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Is this a marker?

```
1 class Marker {
2     ...
3 }
4 class E11IntroPoo {
5     public static void main(String[]
6         Marker
  marcadorBlanco = new Marker
  ();
7         ...
8     }
9 }
```

Is this a marker?

```
1 class Marker {
2     ...
3 }
4 class E11IntroPoo {
5     public static void main(String[]
6         Marker
  marcadorBlanco = new Marker
  ();
7         ...
8     }
9 }
```

▦ Class vs Instance

Functions have a similar nature:

```
1 int myFunc(){   -- This is a blueprint (implementation)
2 }
3
4 myFunc();        -- This is a physical house (execution)
```

```
1 class Marker {  -- This is a blueprint (implementation)
2 }
3
4 new Marker();   -- This is a physical house (instance)
```

Class vs Instance

With a single blueprint (class Marker) we can create several objects (instances)

- All have the same instance variables (nombreColor, nivelTinta)
- each has it's own instance variables values ([red, 100], [green, 70])

```java
class Marker {
    ...
}
class E11IntroPoo {
    public static void main(String[] args) {
        Marker marcadorBlanco = new Marker();
        Marker marcadorRojo = new Marker();
        Marker marcadorVerde = new Marker();
    }
```

Physical world

All subsidiaries have this variables each has it's own values:

- Location
- Employees
- Working hours

Id	Location	WorkingHours
1	Aguascalientes	10-19 hrs
2	CDMX	09-22 hrs
IdSubsidiary	Employee	
1	Juan	
1	Enrique	
2	Gustavo	

All subsidiaries have
this variables each
has it's own values:

- Location
- Employees
- Working hours

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Michoacana
~location : String ~employees : String[] ~workingHours : String

All subsidiaries have
this variables each
has it's own values:

- Location
- Employees
- Working hours

All meeseeks have
this variables each
has it's own values:

- Requester
- MinAlive
- Objective

Id	Requester	MinAlive	Objective
1	Jerry	33	Improve golf
2	meeseeks 1	16	Help meeseeks die

All meeseeks have
this variables each
has it's own values:

- Requester
- MinAlive
- Objective

Meeseeks

~requester : String
~minAlive : float
~objective : String

All meeseeks have
this variables each
has it's own values:

- Requester
- MinAlive
- Objective

- Microsoft Word
- Videogames

Can you detect any blueprints and it's
instance variables per instance?

Glossary

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Object = Instance
Attribute = Instance variable

Glossary

class
A type that defines the implementation of a particular kind of object.

instance
An object of a particular class. In programs written in the Java programming language, an instance of a class is created using the new operator followed by the class name.

instance variable
Any item of data that is associated with a particular object. Each instance of a class has its own copy of the instance variables defined in the class. Also called a field

References

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https://www.oracle.com/java/technologies/glossary.html