Object Oriented Programming – Java

# Required Software

* Java SDK: <https://www.oracle.com/in/java/technologies/javase-downloads.html>
* IntelliJ IDEA: <https://www.jetbrains.com/idea/>
* Git: <https://git-scm.com/downloads>

# Class and Object

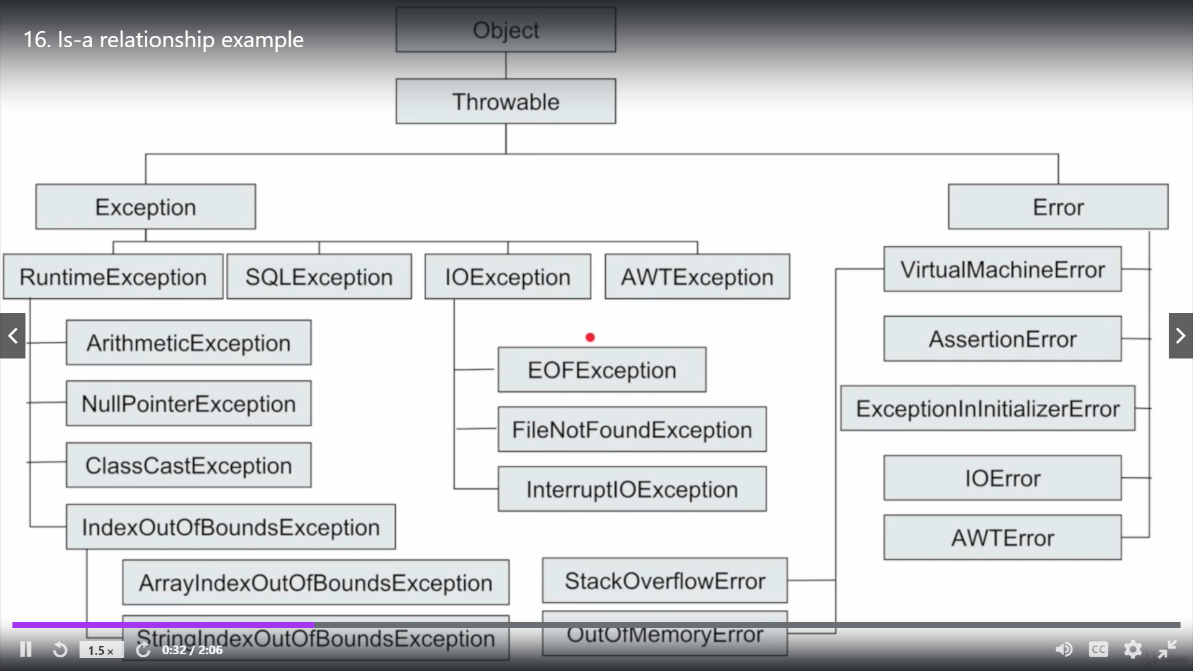
* Object have **State** and **behavior**.
* Classes: Blueprint used to define objects, User Define Data type.
* Class can contain Variable, Methods, Interfaces, Member class, Constructors

# Inheritance

* Is-A Relationship OR Parent-Child Relationship
* Super Class, Parent Class, Base Class – Sub Class, Child Class, Derived Class.
* Parent reference can be used to hold child object(known as Polymorphism) and can’t call child specific methods, but child reference cannot be used to hold parent object
* Every Class in Java is Child of Object class

## Need of Inheritance

* Re usability and Simplicity



## Types of Inheritance

1. **Single Inheritance**: One class inherit only by one class
2. **Hierarchical Inheritance**: One class inherited by two or more classes
3. **Multilevel Inheritance**: One class inherit another class which is also inherit from third class
4. **Multiple Inheritance**: One class inherit from two or more class [**Not supported in Java**]
5. **Hybrid Inheritance**: Combination of above Inheritance types

**Has-A Relationship**

**Composition & Aggregation:**

In Composition Container & Contained Object strongly associated, And in Aggregation Container & Contained Object weakly/loosely associated.