



# Object Oriented Programming

Chapter 1: Introduction to OOP

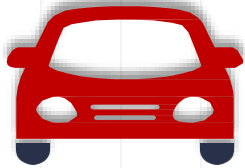
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# Outlines

- W**hat is Object-Oriented Programming ?
- P**rocedural vs. Object-Oriented Programming
- OO** Programming Concepts
- C**oncept of Objects and classes
- UML Class Diagram
- V**isibility Modifiers and Accessor Methods
- F**ull Example

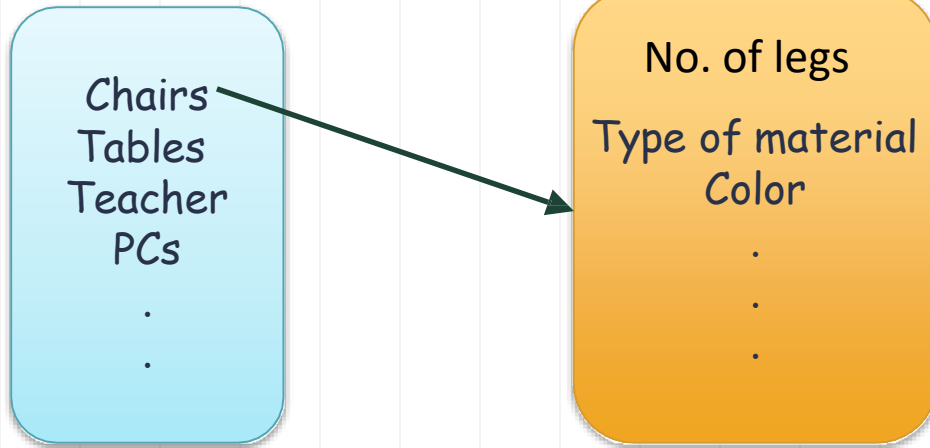


# Our Life is a set of Objects



# What is OOP?

- To have a fine definition of OOP, Please note what you can see in your class room now?



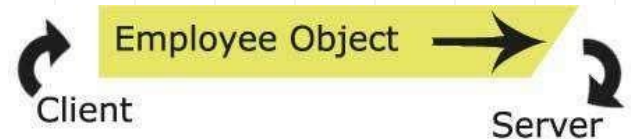
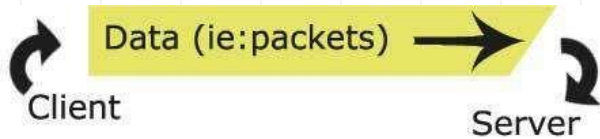
# What is OOP?

- Object-oriented programming (OOP) involves programming using objects.
- An object represents an entity in the real world that can be distinctly identified.
- For example, a student, a desk, a circle, a button, and even a loan can all be viewed as objects.
- An object has a unique identity, state, and behaviors.

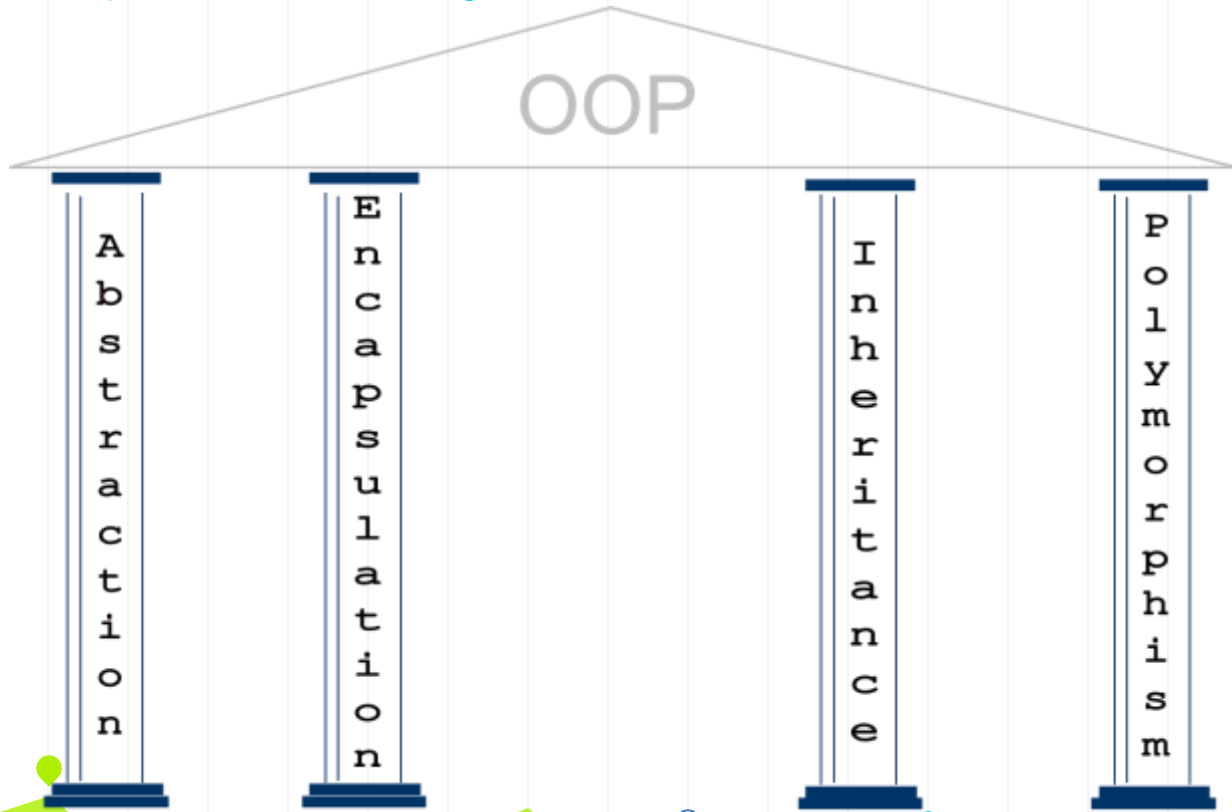


# Procedural vs. Object-Oriented Programming

- The unit in procedural programming is **function**.
- Procedural programming concentrates on **creating functions**.
- Procedural programming **separates** the data of the program from the operations that manipulate the data.
- The unit in object-oriented programming is **class**.
- Object-oriented programming starts from **isolating the classes**, and then look for the methods inside them.
- Object-oriented programming focus on **both of them**.

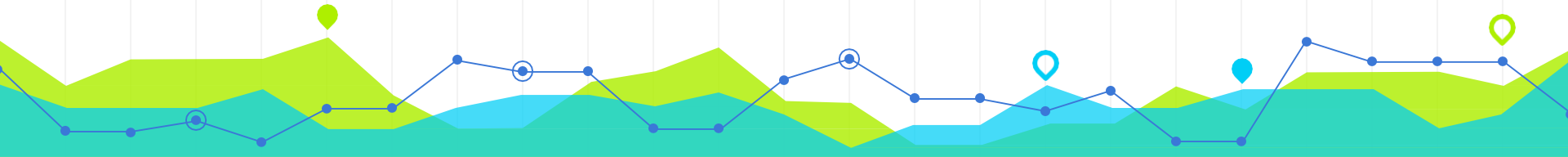


# Concepts of Object-Oriented Programming



# Abstraction

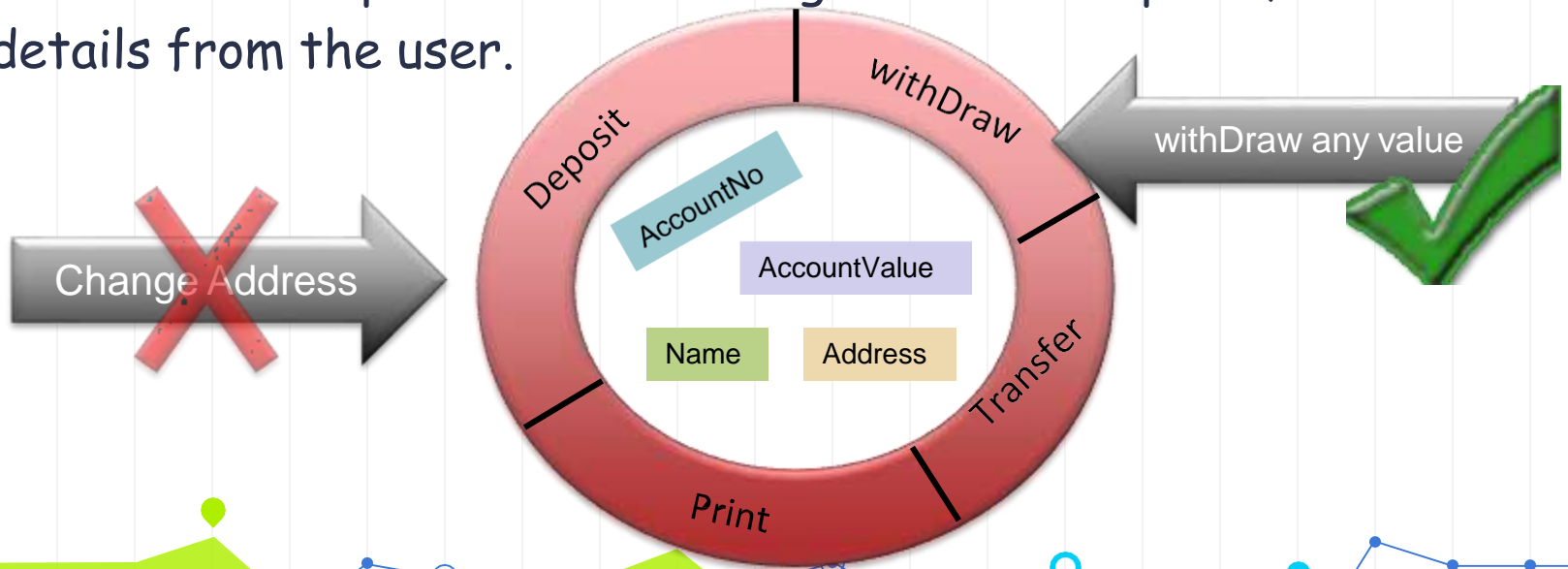
- Abstraction is simplifying complex reality by modeling classes appropriate to the problem.
- Abstraction is mechanism to show only relevant data to the user.
- i.e: The client cares about what functionality a car offers, not about how that functionality is implemented.





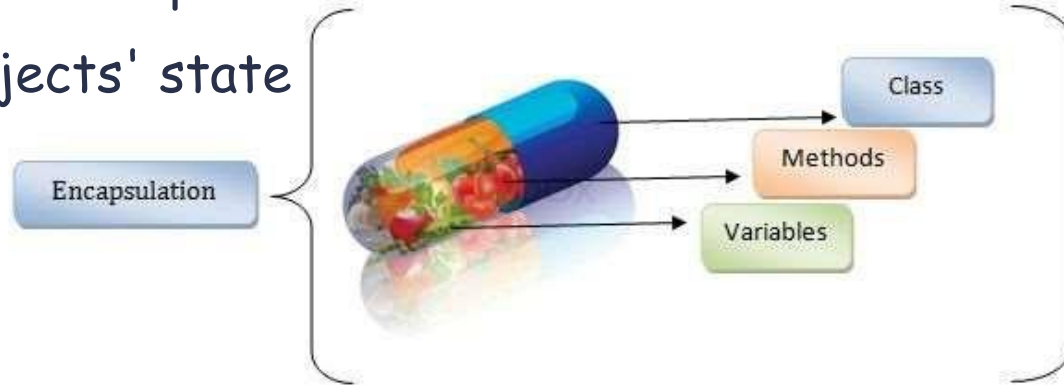
# Encapsulation

- Encapsulation allows the programmer to group data and the methods that operate on them together in one place, and to hide details from the user.



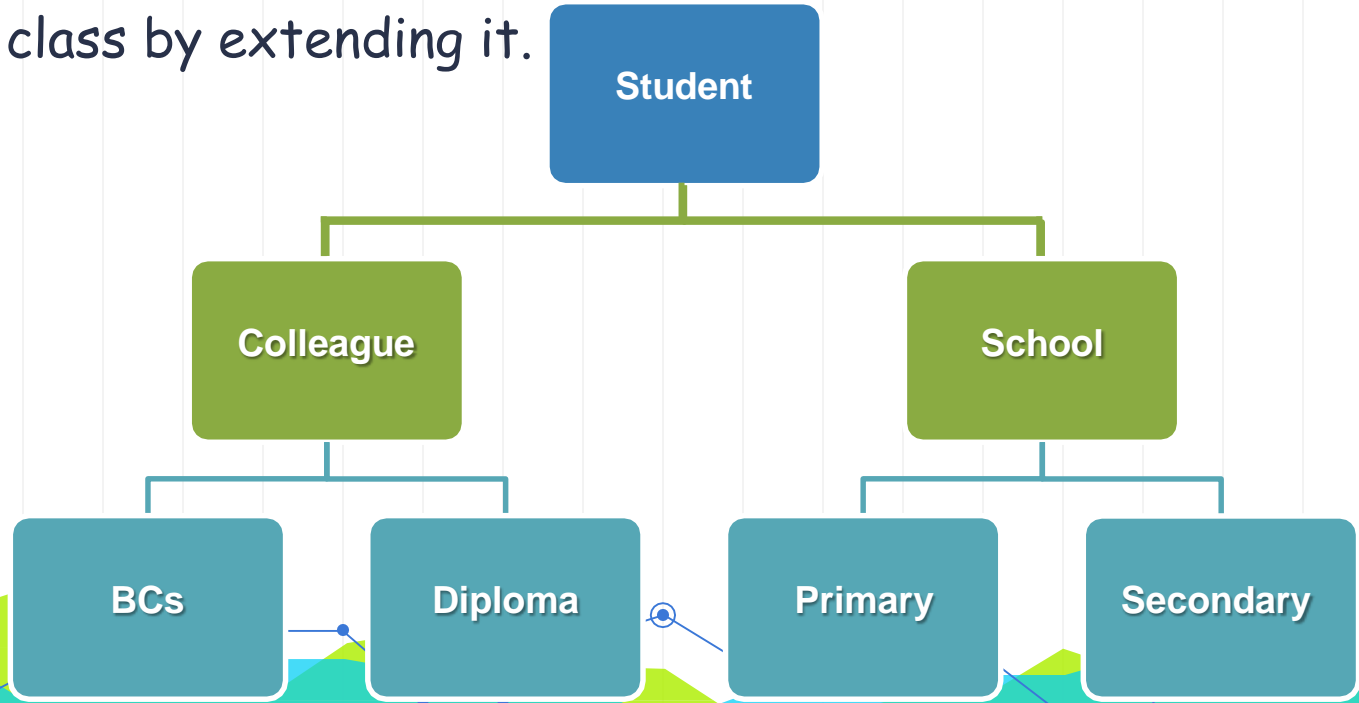
# Benefits of encapsulation

- Encapsulation protects the integrity of an object's data.
- Protects an object from unwanted access by clients.
- ✓ A bank app forbids a client to change an Account's balance.
- Allows you to change the class implementation.
- Allows you to constrain objects' state



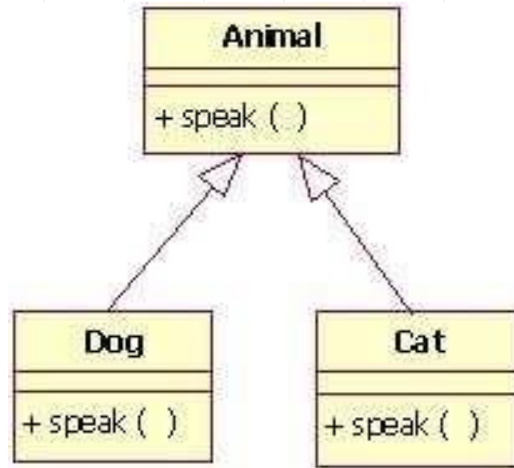
# Inheritance

- Inheritance: The ability of a new class to be created from an existing class by extending it.



# Polymorphism

- Polymorphism enables us to "program in the general" rather than "program in the specific."



# THANKS!

