



Object Oriented Programming using Python (I)

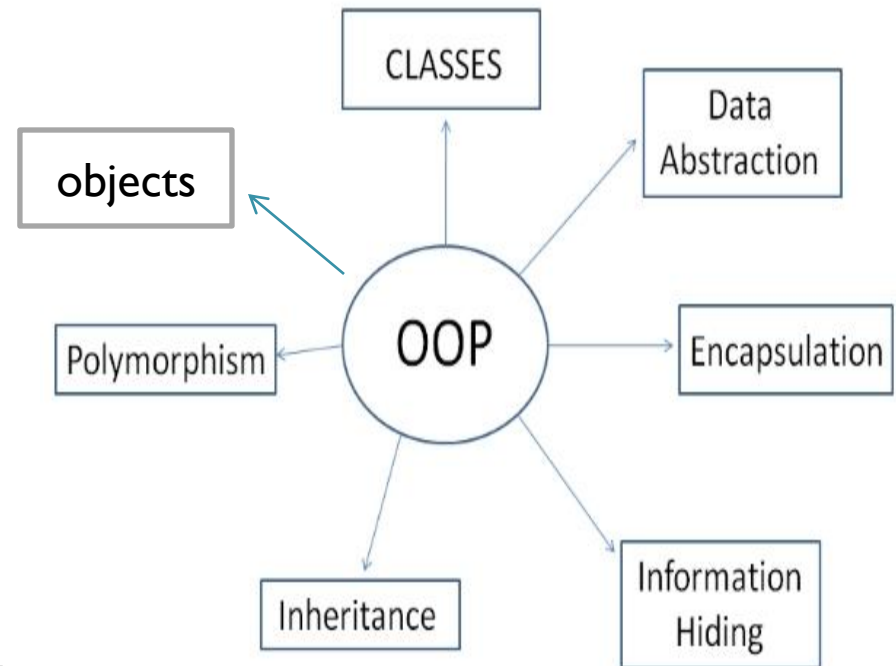
Lecture(5)

Review of OBJECT ORIENTED PROGRAMMING CONCEPTS

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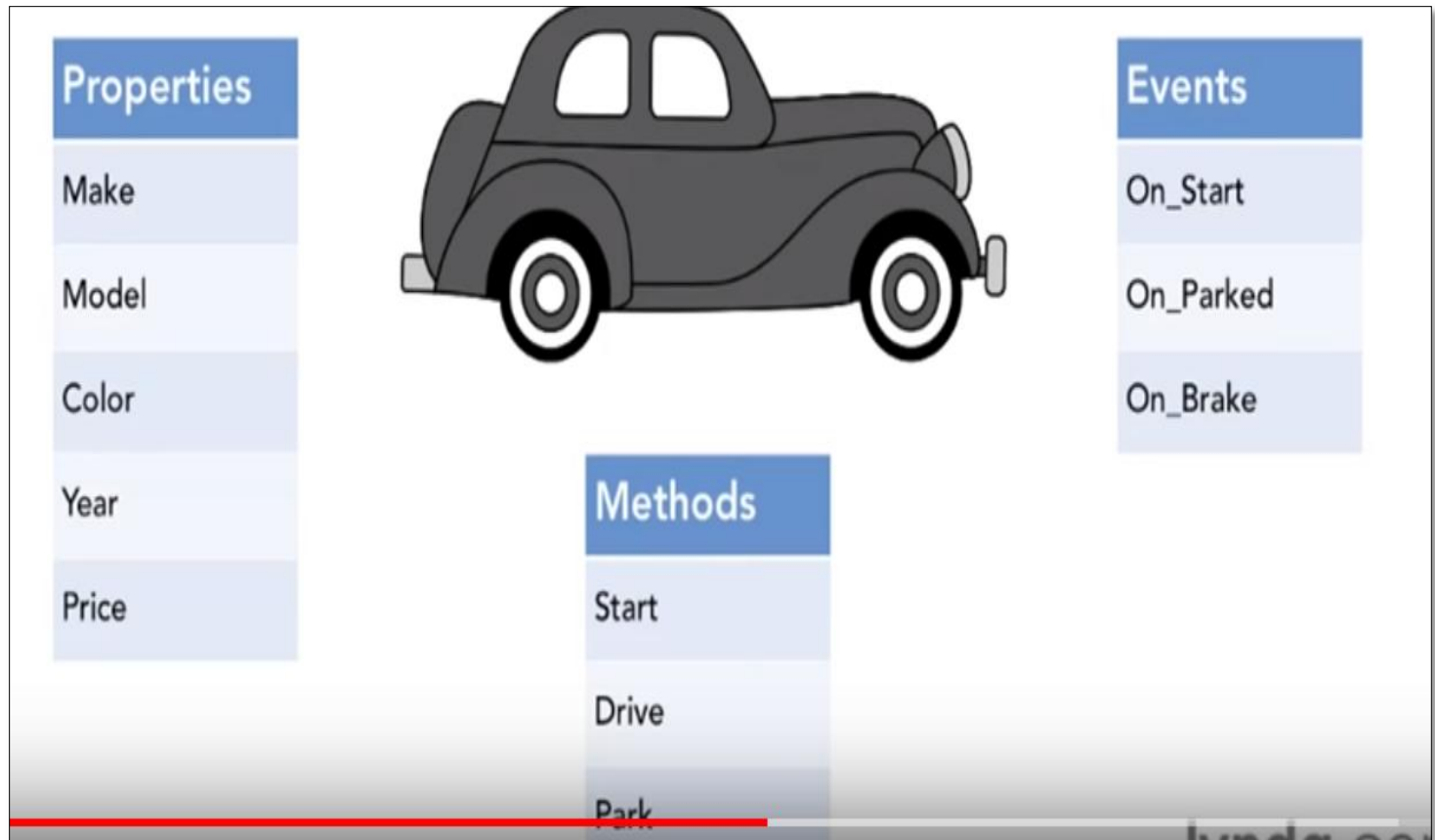
Basic concepts of OOP

- Classes
- Objects
- Data abstraction
- Encapsulation
- Inheritance
- Polymorphism
- Information hiding



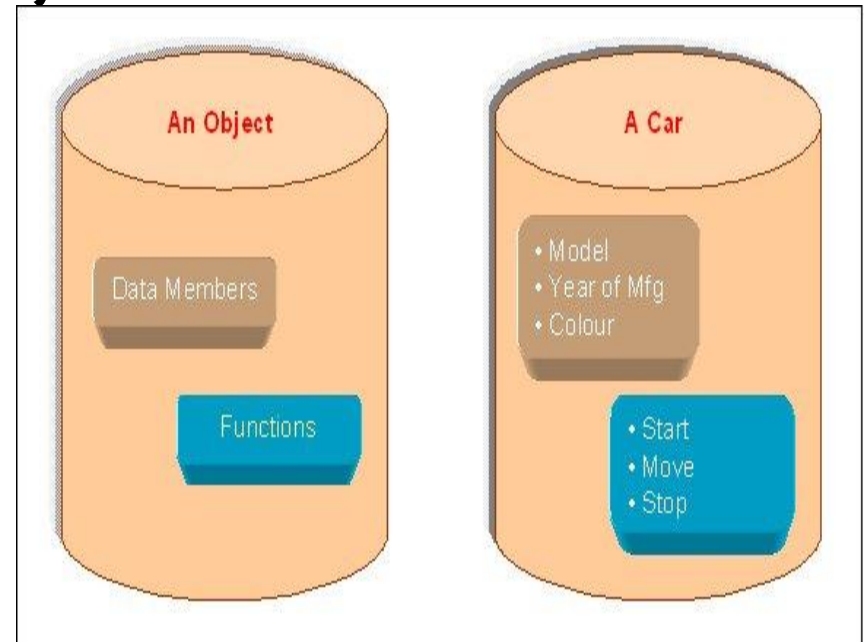
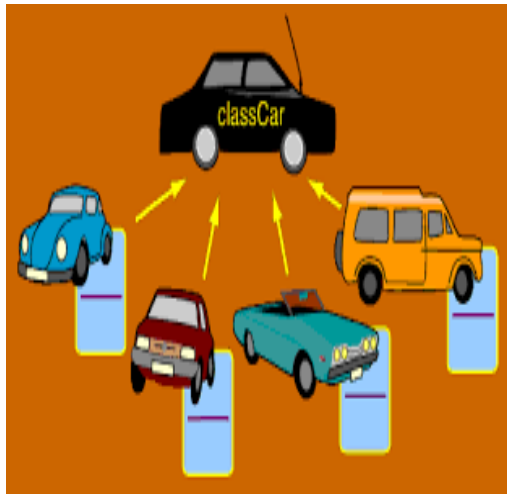
Class

➤ **Class:** is a template definition of the method s and variable s in a particular kind of object . Thus, an object is a specific instance of a class



Objects

- This is the basic unit of object oriented programming that is both data and function that operate on data are bundled as a unit called as object



Data Abstraction

- Data abstraction refers to, providing only essential information hiding their background details
- i.e., to represent the needed information in program without presenting the details
- In simple words, abstraction is ‘Hiding implementation details behind the interface’ When abstraction is created our concern is limited to what it can do rather how it is doing it
- Eg:database system hides certain details how data is stored and created and maintained

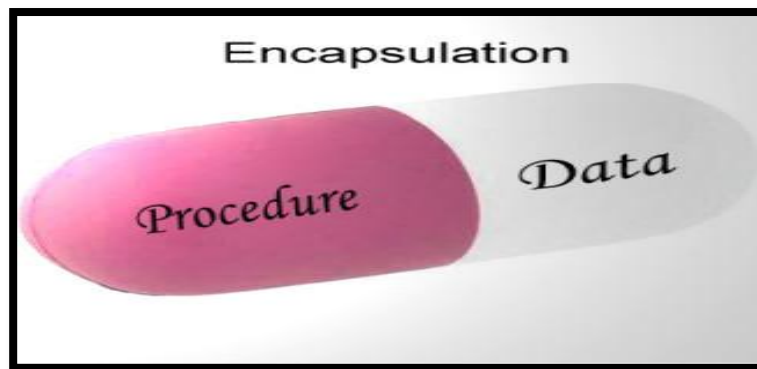
Abstraction

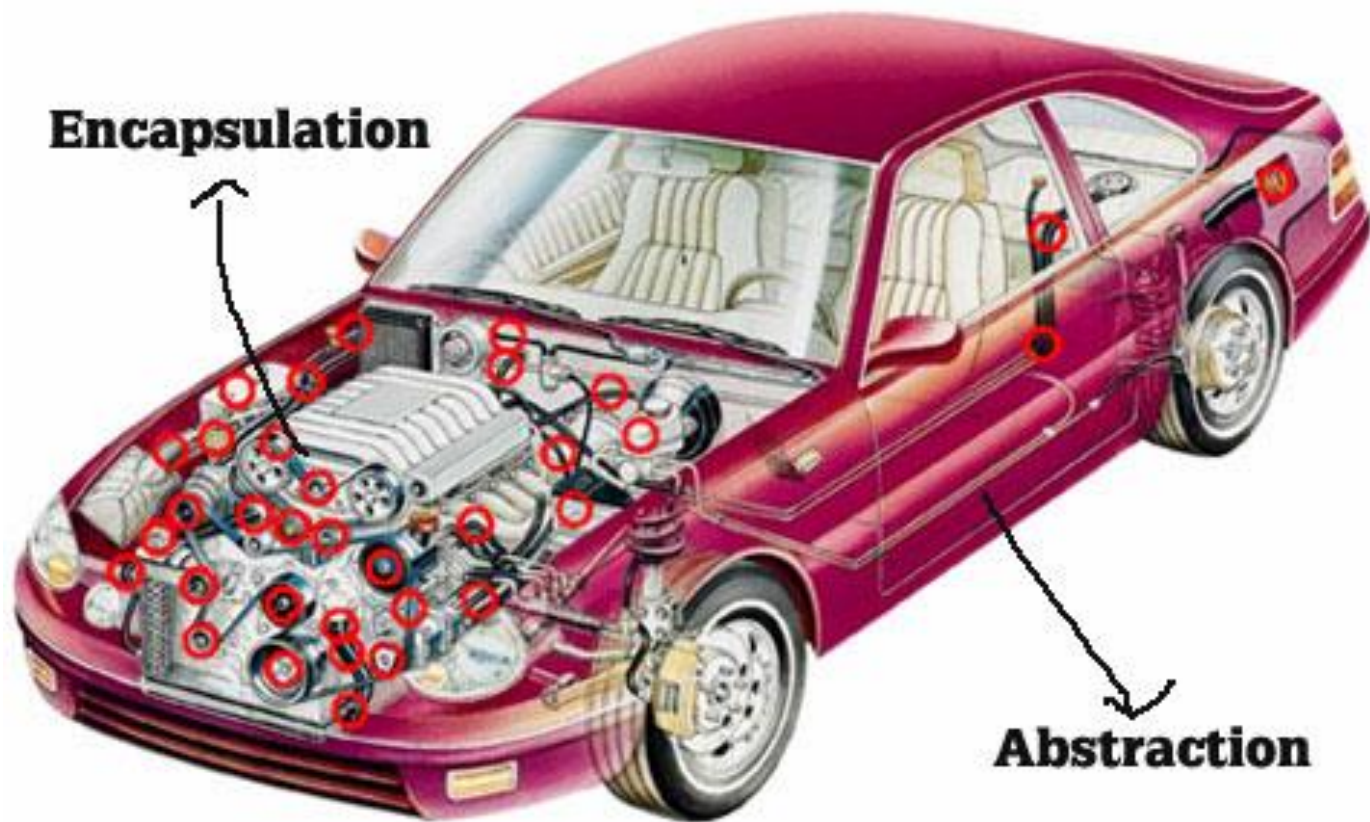
- Abstraction: a process of **Generalizing** things
 - “Suzuki car is a car. Toyota car is a car. Honda car is a car. All 3 of these have front lights. So all cars must have front lights.” Here, we are generalizing that all cars have front lights based on **common property** (front lights) of 3 different **instances** (honda car, toyota car and suzuki car).



Data Encapsulation

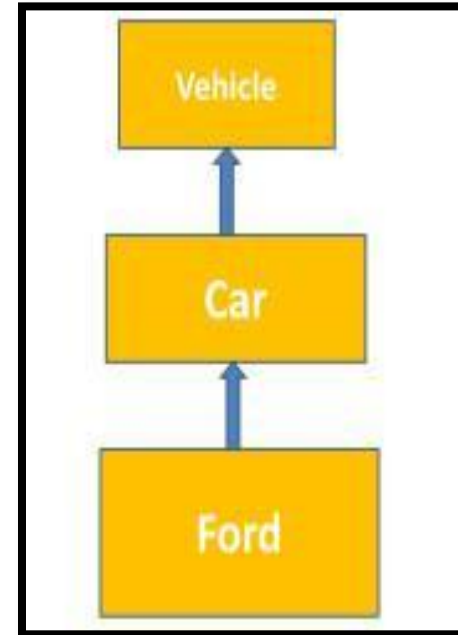
- The packaging of data and functions into single unit called encapsulation
- Data is not accessible to outside world and only functions wrapped in class can access it
- Isolation of data from direct access by the program is called **Data Hiding**

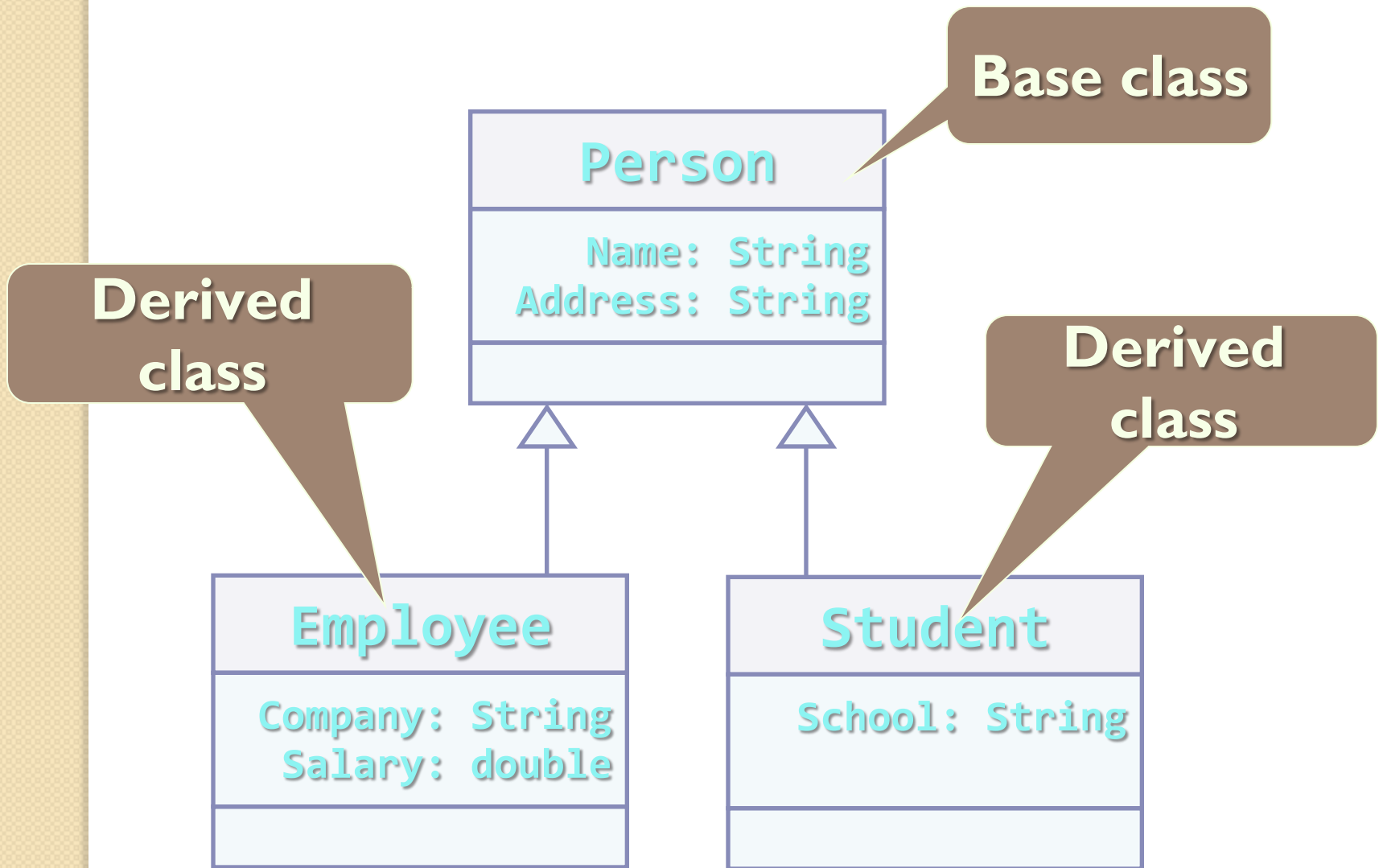




Inheritance

- Inheritance is the process of forming a new class from an existing class
- The existing class called as base class, new class is formed called as derived class
- In OOP the concept of inheritance provide idea of reusability
- We can add additional feature to an class without modifying it

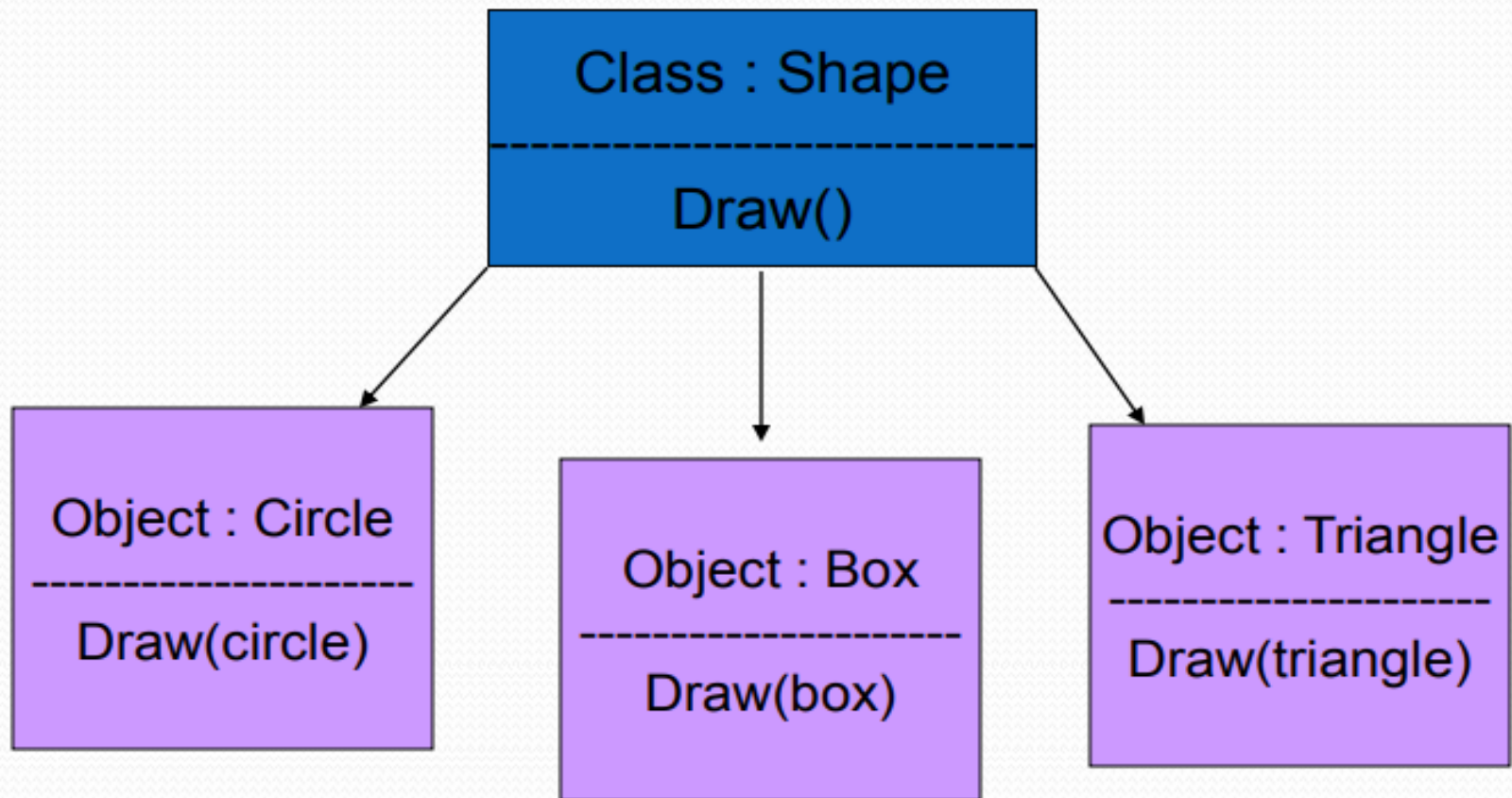




Polymorphism

- Polymorphism means ability to take more than one form
- Poly refers to many
- This is an operation may exhibit different behavior in different instances

Polymorphism



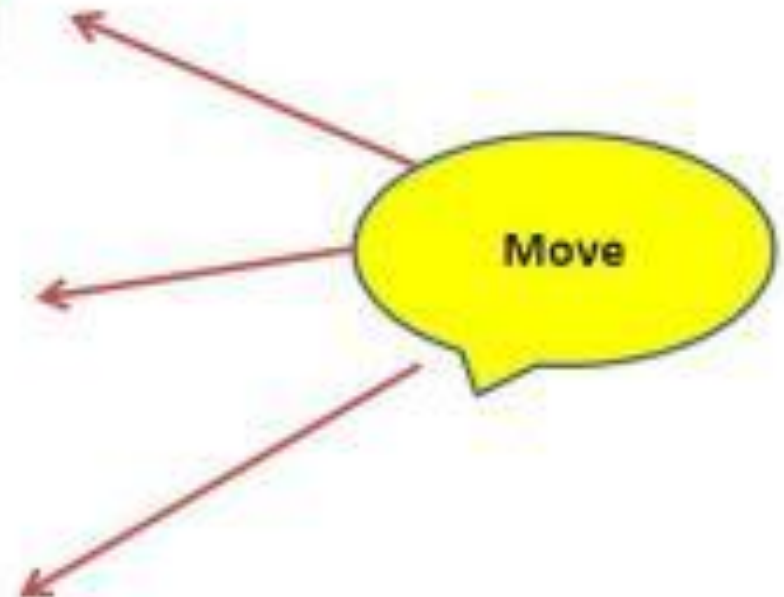
Car



Ford



Honda



- Car uses normal engine to move
- Ford uses V engine to move
- Honda uses i-vtec technology to move

Information Hiding

- Information hiding is the primary criteria of system modularization and should be concerned with hiding the critical decisions of OOP designing.
- Information hiding isolates the end users from knowledge the internal design of an object.

