

Object Oriented Programming in Python

- Procedural vs OOPs Concepts**
- Build a Resort Management software using OOPs**

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How programs/applications were written earlier before OOPs?

- Suppose we wrote code in linear way as a huge ream of instructions in a single file. It might look something like this:

main program:

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if =====
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while =====
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for =====
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```

Huge Lines of Code

main program:

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if =====

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while =====

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for =====

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if =====

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Huge lines of Code will become unmanageable

Procedural Programming

- The first *programming paradigm* arises from. It's called *procedural programming*, and it employs procedures or functions to break down our endless ream of code into more manageable pieces. A procedure or function is a block of instructions that can be *called* from anywhere;

main program:

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call fred

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if =====

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call eric

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Call a Procedure

procedure fred:

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=====

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procedure eric:

if =====

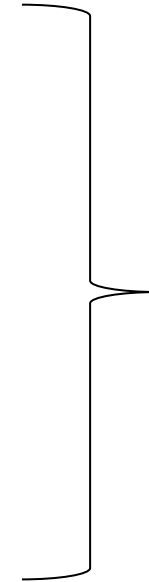
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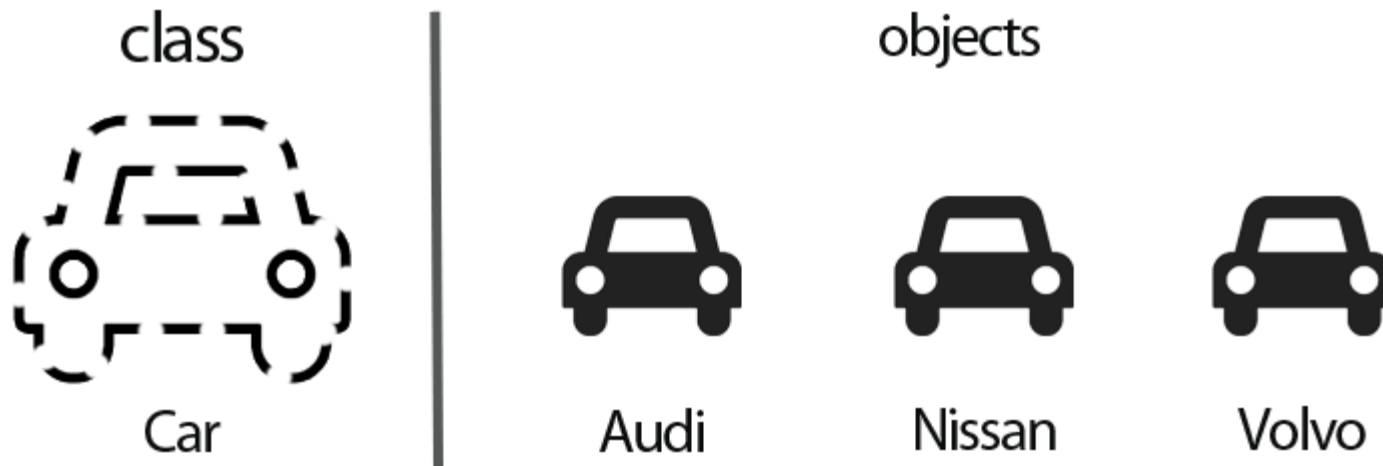
Procedure

Then came Object Oriented Programming

OOPs solved the problems of procedural programming.

Object-oriented programming is a programming paradigm based on the concept of "objects", which can contain data, in the form of fields, and code, in the form of procedures. A feature of objects is an object's procedures that can access and often modify the data fields of the object with which they are associated.

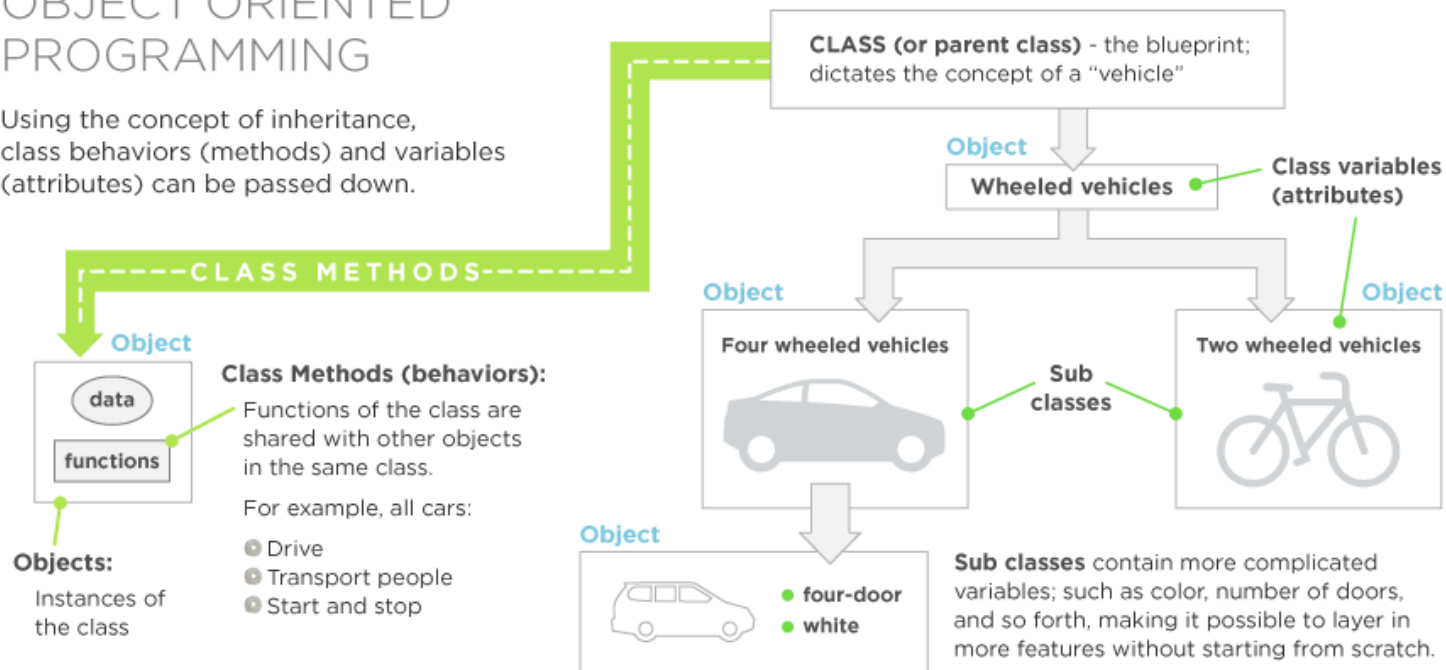
What is a Class, what is an Object



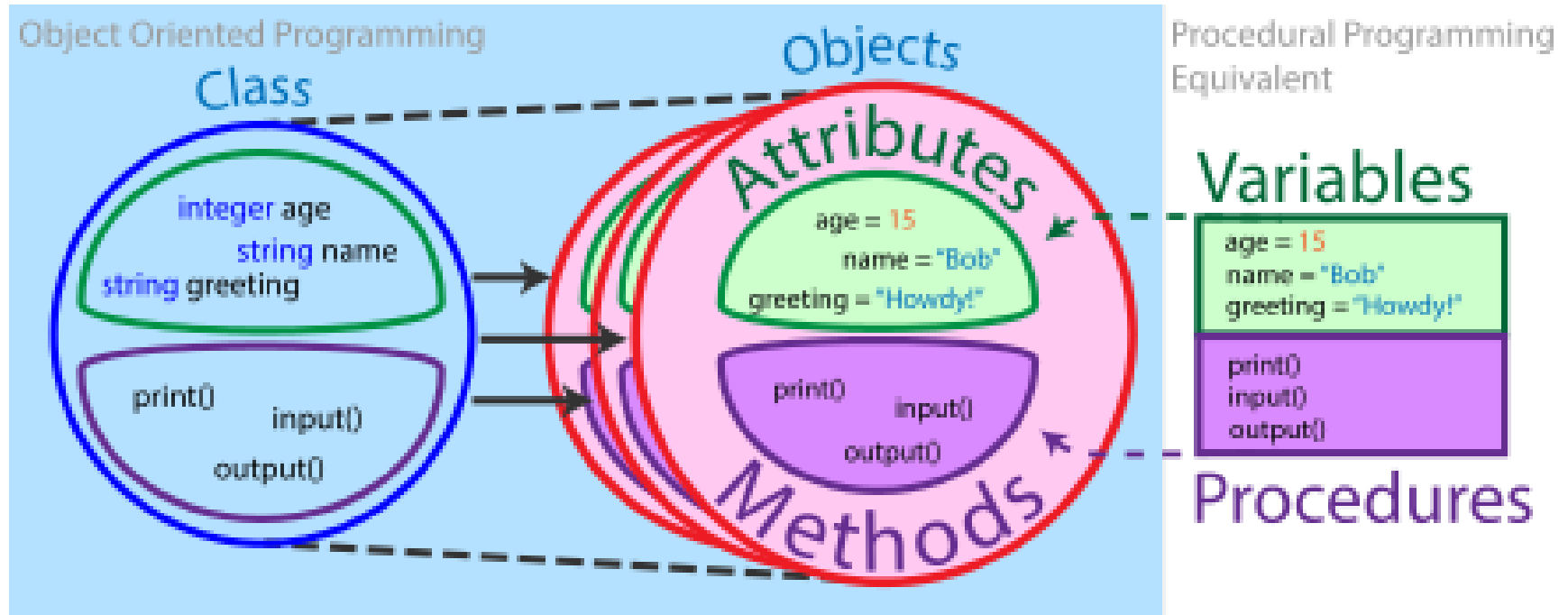
Class and Object are defined base on the Business Problems

OBJECT ORIENTED PROGRAMMING

Using the concept of inheritance, class behaviors (methods) and variables (attributes) can be passed down.



Object Oriented Programming



Note: In python the data types are not declared

What is an Object?

- A software item that contains **variables** and **methods**
- Object Oriented Design focuses on
 - **Encapsulation:**
dividing the code into a public **interface**, and a private **implementation** of that interface
 - **Polymorphism:**
the ability to **overload** standard operators so that they have appropriate behavior based on their context
 - **Inheritance:**
the ability to create **subclasses** that contain specializations of their parents

Build a - Reservation Management System for a Resort

Example-See the Jupyter Notebook File
OOPHotelWorkingCode-Training.ipynb

Reservation Management Software for a Resort

- To make this a fun learning experience, let us design the classes for the RMS of a boutique resort that rents villas in **Blue Lagoon Resort , Miami, Florida**
- The resort rents four standard villas and two VIP villas. VIP villas are larger and come with a personal yacht. All villas come with a personal assistant.
- THE VILLA TYPES ARE :
 1. #villa
 2. #vipvilla

Reservation Management Software for a Resort

- What are the different classes we need for implementing the software?
- 2 types of rooms- villa, vip villa
- **Class villa** (rooms or room types, basic standard villa)
- **Class vipvilla** (rooms or room types, basic standard villa+ more facilities)
- *****
- **Class guest**
- **Class reservation**
- **Class resort**

Reservation Management Software for a Resort

- What are the different classes we need for implementing the software?
- THE VILLA TYPES ARE :
 1. #villa
 2. #vipvilla
 3. GUEST: Class guest encapsulates the following attributes of a guest: first and last name, number of adults, and number of children in the room. It offers an access function to last name and a printing function for the guest object.

Reservation Management Software for a Resort

4. Reservation Class: Reservation encapsulates the following attributes of a reservation: the name of the reserved villa, checkin date, checkout date, reservation ID, a printing function for the reservation class.
5. Resort Class resort encapsulates the following attributes: a list with the names of the (standard) villas, a list with the names of the VIP villas, a guest list, a reservation list and a reservation ID list. It also offers access functions to a Guest object, Reservation object, reservation ID and a function that prints all lists.

Class

- 2 types of rooms- villa, vip villa
- **Class villa** (rooms or room types, basic standard villa)
- **Class vipvilla** (rooms or room types, basic standard villa+ more facilites)
- *****
- **Class guest**
- **Class reservation**
- **Class resort**

Create Class Villa

- Properties
- -Name
- -Personal Assitant
 - Methods
- CleanandChangeKey
- GiftLabel

Class VipVilla(villa)

- Properties
 - Villa.Name of person
 - Villa.Personal Assistant
- Methods
 - **Special Services**

Class Guest

- properties
 - Name
 - Age
 - No.Adults
 - No.Children
- Method
 - Get LastNameofGuest()

Class Reservation

- Checkindate
- Lengthofstay
- Villaname
- Checkoutdate()

Class Resort

- List of villas,Names
- Guest lists
- Reservationlist
- reservationids

END