Holistic View of Class

Class and Object in Real World

Let's suppose we have to develop a software for Car Showroom.

Class and Object in Real World

The showroom wants to develop a website that allows the users to change the color of a car by clicking on the car model and turn lights on and off by clicking on the lights.

Class and Object in Real World

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How can we model the backend? We need to define the Class only.

Class and Object in Real World

We need to store the information of cars.

Class and Object in Real World

Step 1: First, convert real time car information into computer code.

Class and Object in Real World

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Class and Object in Real World

Step 1: We have to identify the attributes that our application required for these cars.

Class and Object in Real World

Some of these attributes are

1. Color
2. Lights
3. Model

Common Characteristics

These are all common characteristics of the cars as well

1. Color
2. Lights (on or off)
3. Model

Common Operations

Showroom wants, for interactive experience, user can change the color of cars or turn light on and off

1. Toggle Light
2. Change Color

Common Operations

To meet the requirements, every car has two functions performed on its data

1. Toggle Light
2. Change Color

Activity

Define Class, its attributes (Data Members) and Functionalities (Functions or Behaviours).

Real World

To model it in the computer code, we have to combine the data requirement and operations on these data into a class.

Real World

In case of Showroom the corresponding class will be

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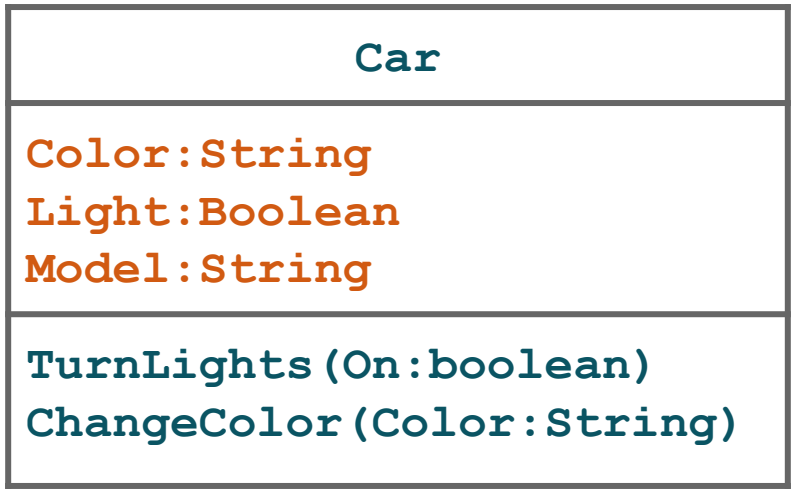
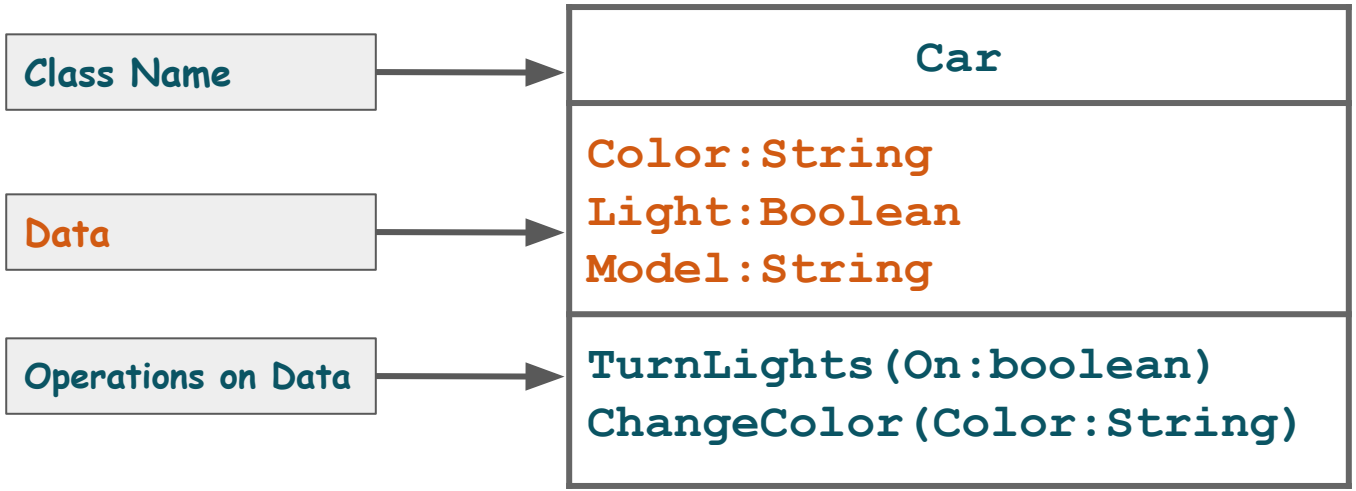


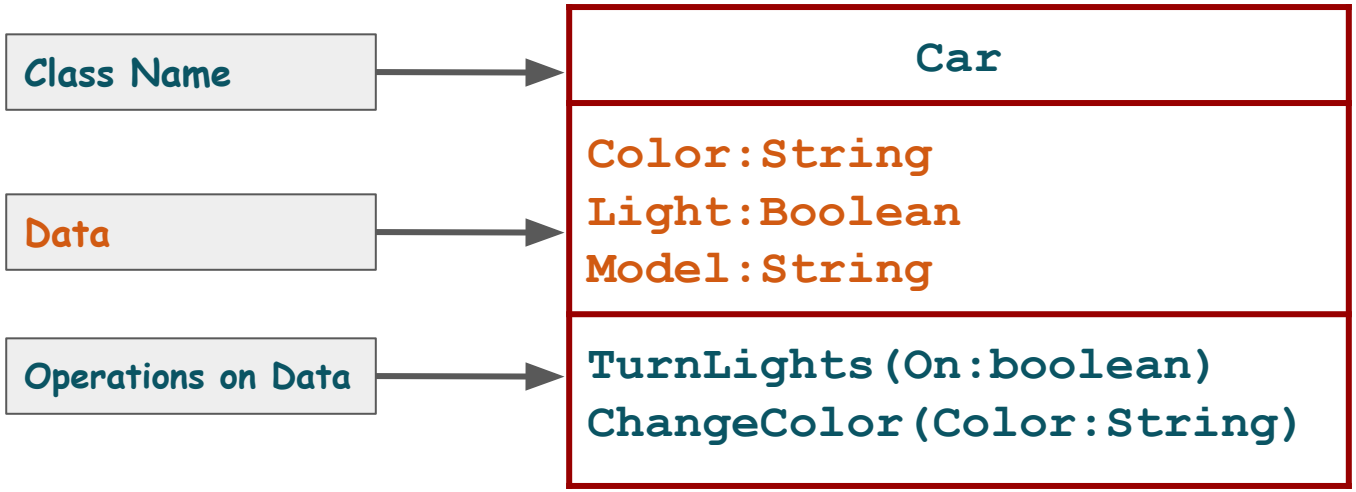
Real World

In case of Showroom the corresponding class will be



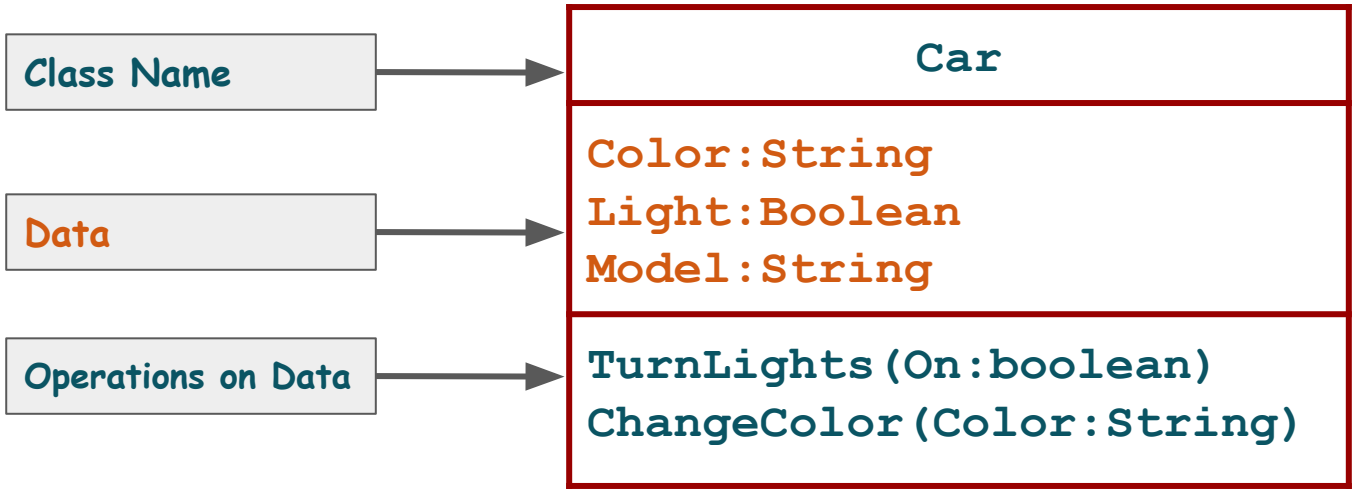
Class Responsibility Collaboration Card

The box at right side is also called Class Responsibility Collaboration Card (CRC).



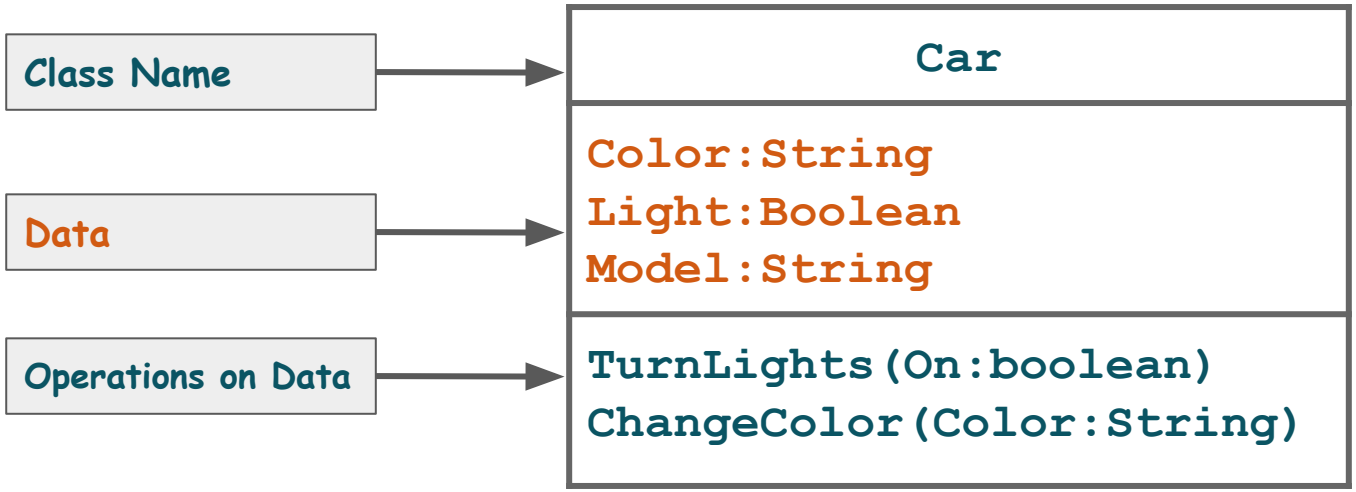
Class Responsibility Collaboration Card

The Header of CRC card mention the class name, the second part of it represents the data members, and last lists down the name of operations.



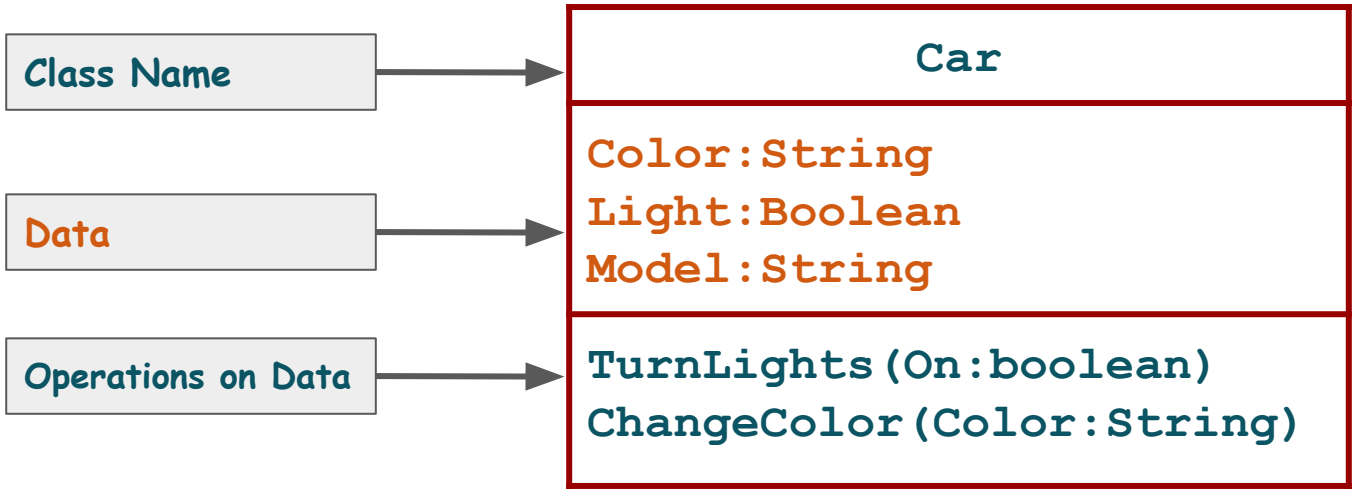
Data Members

Each Data item is also called data members, attribute or field of the class.



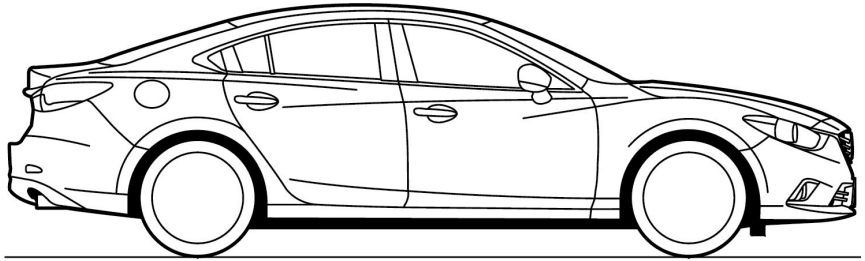
Member Functions

Each operation on data is also called member function or Behaviour of class.



Class: Blueprint

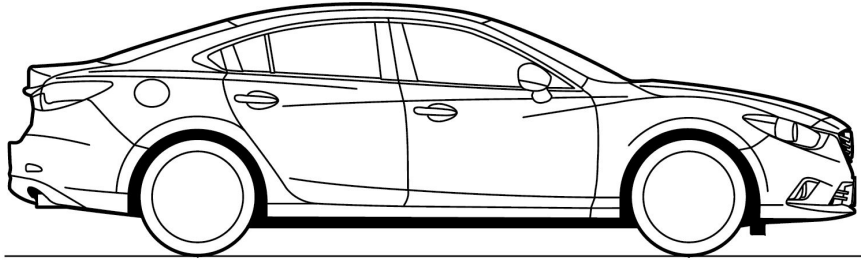
Class is a Blueprint.



Class: Blueprint of a Car

Object is Realization of Class

Class is a Blueprint while object is realization of the Class.



Class: Blueprint of a Car

Objects: Cars

Object is Realization of Class

Color=Red
Lights=On
Model=Mustang

Class Name

Data

Operations on Data

Car

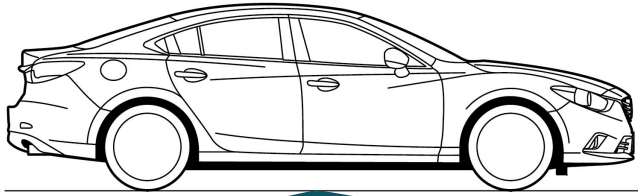
Color:String
Light:Boolean
Model:String

TurnLights(On:boolean)
ChangeColor(Color:String)

Many Realization (object)

Car
Color:String Light:Boolean Model:String
TurnLights(On:boolean) ChangeColor(Color:String)

Class
Car



Car
Objects

Color=Red
Lights=On
Model=Mustang

Color=Green
Lights=Off
Model=Wolkswgen

Color=Blue
Lights=Off
Model=Prius

Identify Classes, Data and Behaviour

Now, we need to identify the classes, data and behaviour from real time scenarios.
Suppose you have to implement a software for a College or University Student Record Management System. University should maintain the information about student's full name, roll number, cgpa, matric marks, fsc marks, ecat marks, current semester, fees, home town, whether day scholar or hostelite and whether availing a scholarship or not.Merit of student can be calculated by adding 60% of Fsc Marks and 40% of ECat marks. Students can check their scholarship status: A student is eligible for scholarship if her merit is greater than 80% and she is hostelite.

Identify Classes, Data and Behaviour

Suppose you have to implement a software for a Library Management System. The library system must keep track of the books whether the book is available or borrowed. Books contains the title, list of chapters, number of pages, price, name of the author.
A person can see is the book available or borrowed. He can also see the bookmark is on which page number. Also he can see the name of a specific chapter.
What will be class for Book, its Data Members, and Behaviours.

Conclusion

- Class is a Blueprint while object is realization of the Class.
- The Header of CRC card mentions the class name, the second part of it represents the data members, and last lists down the name of operations.
- Each Data item is also called data members, attribute or field of the class.
- Each operation on data is also called member function or Behaviour of class.

Learning Objective

Identify Classes from Real World Scenarios.

Self Assessment: Class and Objects

1. Identify the Primary class, its attribute and behaviour in form of CRC (Class Responsibility Collaboration) Card
   - Patient Management System (only for patients)
   - Stock Management System (only to keep records of products)
   - Identify Behaviours for Ghost in PacMan Game