

# *COEN-244*

## *Tutorial #2*

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January 26<sup>th</sup>, 2023

# OOP Overview

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**Object Oriented Programming** is the process of defining your program/procedure in terms of objects :: objects give sensible functionality (complements) to the program

- Classes define the bases characteristics/behaviors of the objects
- 'Classes' in OOP refer to classification of a set of objects that have behave similarly and have homogeneous properties
- **Advantages of OOP:** Clearly Structured Code, Keeps code DRY (Don't Repeat Yourself): easier to Modify, Debug & Maintain
- OOP is heavily used in implementing DSA
- It also helps with writing less comments!

# Things to know before going ahead

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- Differences between classes and objects(instances)
- Attributes, Methods, Constructors, Destructors, and Encapsulation
- **Encapsulation:** Public, private, and protected
- Accessors (getters) and mutators (setters)
- Code organization – separate .h and .cpp files
- **Static variables** – how to give special IDs to objects
- Member initialization list
- C++ Structures (Structs)

# Some OOP Concepts

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- **Data Abstraction:** Showing only what is necessary
- **Encapsulation:** Giving the right permissions
- **Data members:** Defining the objects
- **Use of Pointers:** Dealing with pointers in OOP
- **Functions & Objects:** Use-cases of objects in procedural funcs

*Let's link all this together, shall we?!*

# Examples of OOP

## Examples of Objects



LightBulb

- **state/attributes**

- on (true or false)

- **behavior**

- switch on
- switch off
- check if on



Car

- **state/attributes**

- # of liters of gas in tank
- total # of km run so far
- efficiency (km/liter)

- **behavior**

- drive
- load gas
- change efficiency
- check gas
- check odometer reading



BankAccount

- **state/attributes**

- balance

- **behavior**

- deposit
- withdraw
- check balance

### Note

- each object is an "instance" of that "class" of object
- each instance has its own values for its attributes
  - e.g., different accounts can have different balances

*THANK YOU*

