Object Oriented Programming and Concepts I

Phase 1 - Class and Object

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What will you learn today?

- What Is Object-Oriented Programming?
- What are the main concepts in Object-Oriented Programming?
  - **Class**
  - **Object X Instance**
  - Inheritance
  - Encapsulation
  - Polymorphism
- What is a class?
- Object X Instance
- Practical Example

What is OOP?

- You need to create a system to register the books in a library using **structure programming**
- What you need?
  - You need a way to represent each book characteristic
    - Title
    - Author(s)
    - Publisher
    - Number of pages
 - Variable

What is OOP?

- But if we have 1000 books, we need to create 4 x 1000 variables
  - Is it readable?
- And to access the book information, I need to rewrite the code for each book
- An the access for each information, can we using structure programming guarantee some security related to user types?

What is OOP?

- To help you with these problems, we have
  - **Object Oriented Programming Paradigm**
- With OOP
  - Reuse
  - Levels of access (access modifiers)
  - Code became more readable and easy to maintenance

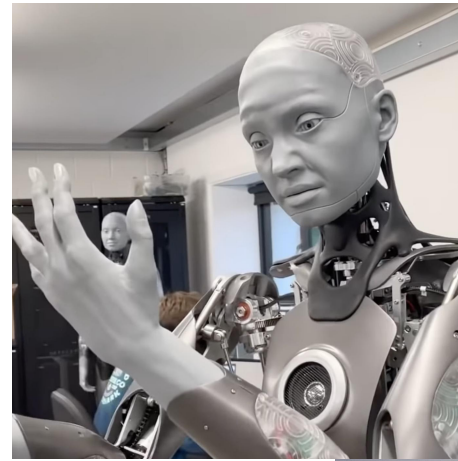# What is Object-Oriented programming?

"It is a programming paradigm in which we looking at a problem, system and identifying the objects and interactions between them."

CLASS

POLYMORPHISM

OBJECT ORIENTED PROGRAMMING (OOP)
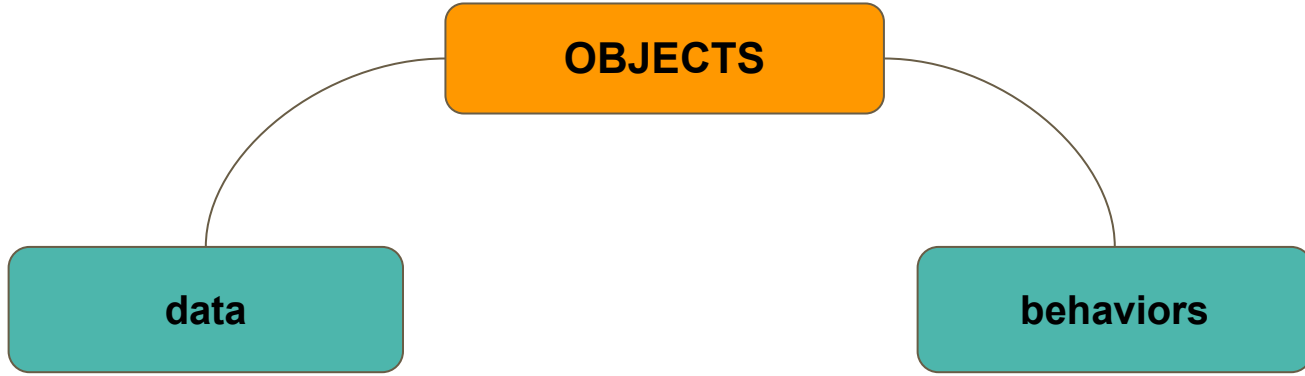
OBJECT

ENCAPSULATION

INHERITANCE
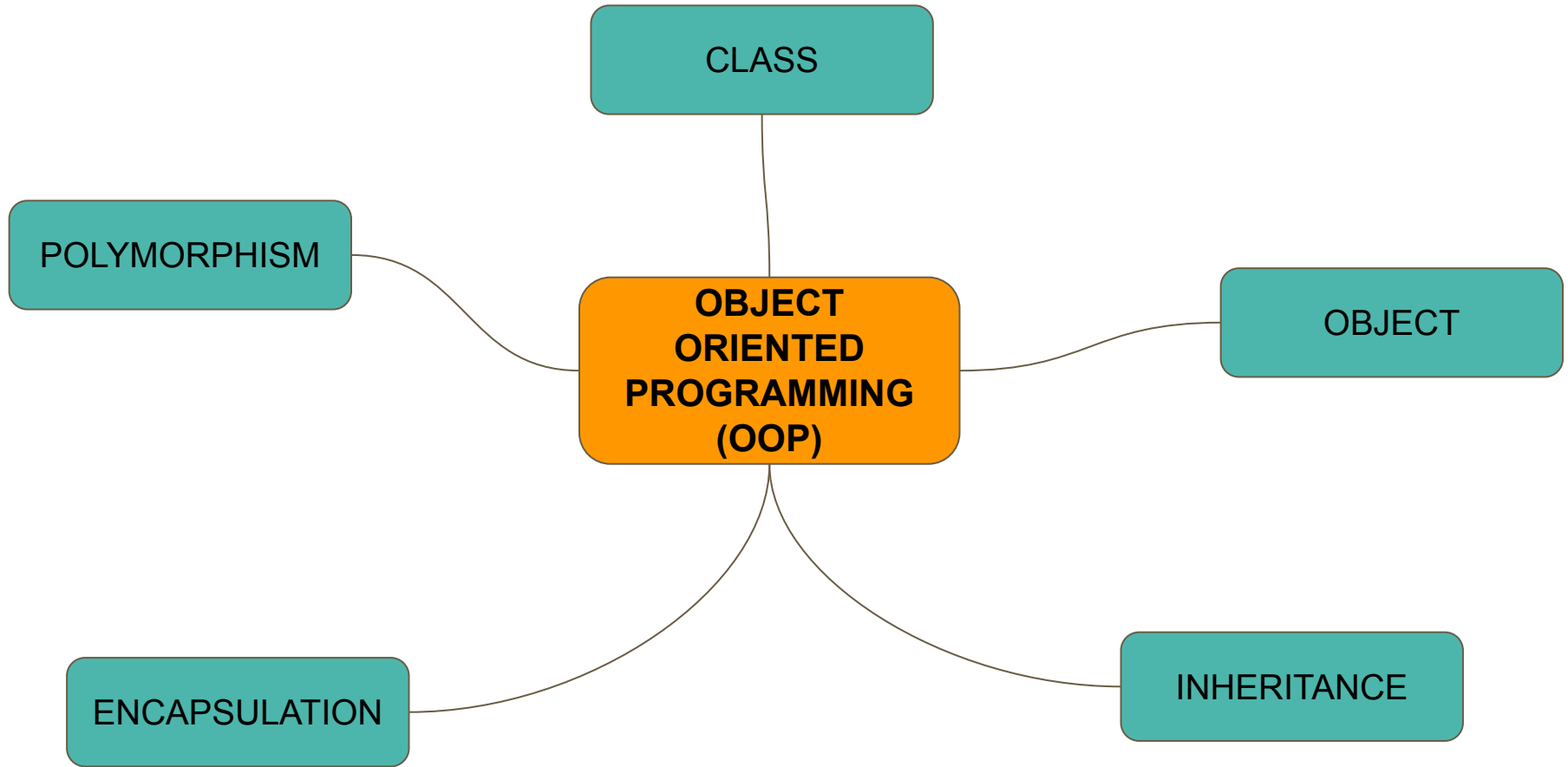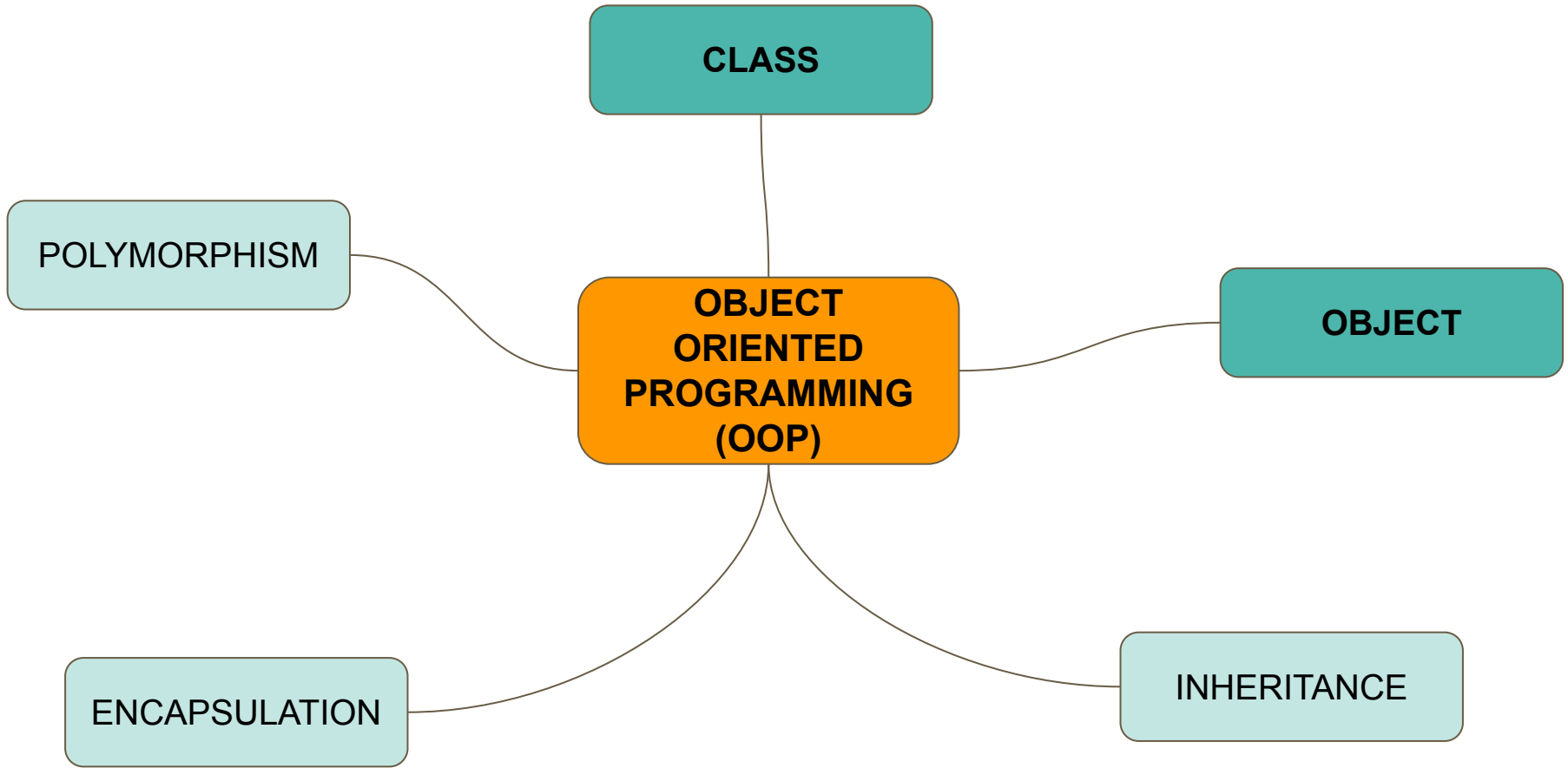
What is a class?

- **Class** in OOP is a **object description**
- But what is a object??

"Objects in software development are models of something that can do certain things and have certain things done to them."

```
                    ┌─────────────────┐
                    │     OBJECTS     │
                    └─────────────────┘
            ╱                               ╲
    ┌─────────────┐               ┌─────────────────┐
    │     data    │               │    behaviors    │
    └─────────────┘               └─────────────────┘
```

Activity - groups of 3 students (5 minutes)

- You will work together to describe at least 4 objects with
  - 4 characteristics of each object
  - 4 behaviors
- Tip
  - You can use the examples that I already used :)

But what are classes?

We can think classes are the models, blueprints for creating objects

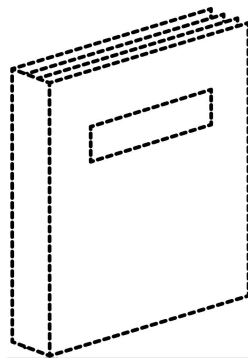A class does not "exist", it is just a model.

In order to have an object using a class, we need to instance an object of a class.

What is OOP?

- What are the common characteristics among books?
  - Title
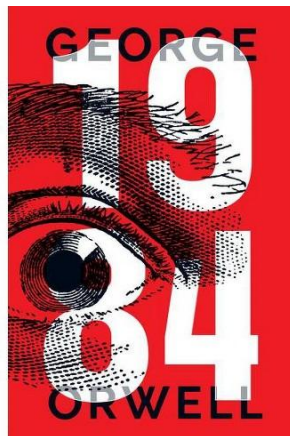 - Author(s)
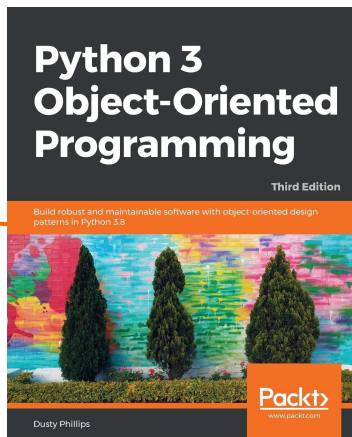 - Publisher
  - Number of pages

Class X Object

Class: Book

- **Title :** *1984*
- **Author(s) :** *George Orwell*
- **Publisher:** *Berkley Books*
- **Number of pages:** *294*

Class: Book

- **Title:** *Python3 Object-Oriented Programming*
- **Author(s):** *Dusty Phillips*
- **Publisher :** *Packt*
- **Edition:** *466*

Class: Book

- **Title**
- **Author(s)**
- **Publisher**
- **Number of pages:**

Let's code together !!!

```python
class Book:

    def __init__(self, title, author, numberPages):
        self.title = title
        self.author = author
        self.numberPages = numberPages


    def setTitle(self, newTitle):
        self.title = newTitle


    def getTitle(self):
        return self.title
```

```python
from book import Book


if __name__ == '__main__':

    book1=Book('1984','George Orwell','294')
    print(book1.getTitle())
    book1.setTitle('1984-2')
    print(book1.getTitle())
    book2=Book('Python3 Object-Oriented Programming','Dusty Phillips','466')
    print(book2.title)
```

Activity

- Create a class Car
  - You need to have at least two characteristics (attributes)
  - And two behaviors (methods)
- Create a main
  - Use your class : create objects, change the attributes values, use the methods

To summarize

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Next class

- Answer the questions
- What are the main concepts in Object-Oriented Programming?
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Reference
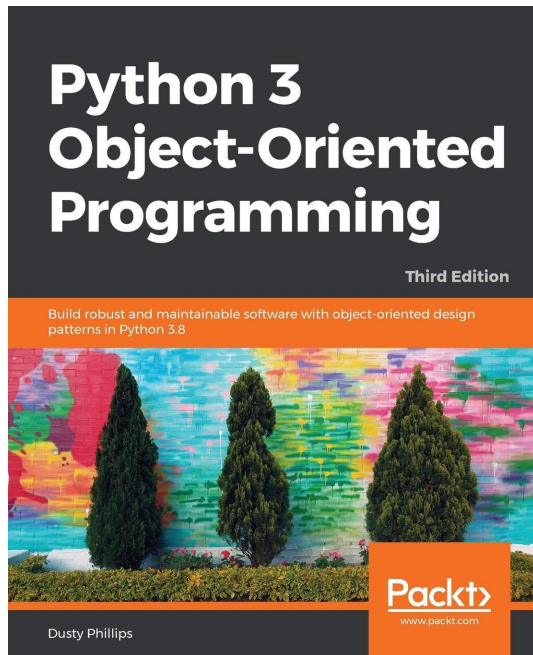
- TitlePython 3 Object-Oriented Programming
- Author Dusty Phillips
- Edition 3
- Publisher Packt Publishing Ltd, 2018
- ISBN 1789617073, 9781789617078
- Length   466 pages

Thanks :)

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