

CW5-3: OOP – Properties – Abstraction

6. Properties - Library and Book

Create a **Book** class that represents a book in a library. The Book class should have the following properties:

- title (string): a string representing the title of the book.
- author (string): a string representing the author of the book.
- publication_year (int): an integer representing the year the book was published.

Note: Implement the necessary **getter** and **setter** methods for each property.

Note: Add some validation for each property. For example: check the type of property if the type is not valid raise an Error.

Additional Methods:

get_age(): This method should calculate and return the age of the book in years, based on the current year and the publication_year.

Extra Features:

- Add a **ratings** attribute (list of floats) to store user ratings for the book.
- Implement a method **add_rating(rating: float)** to add a new user rating to the book's ratings.
- Implement a method **get_average_rating()** to calculate and return the average rating of the book.

Create a **Library** class that represents a library. The Library class should have the following properties:

- **name** (string): a string representing the name of the library.
- **books** (list of Book objects): a list representing the books in the library.

Note: Implement the necessary **getter** and **setter** methods for each property.

Note: Add some validation for each property. For example: check the type of property if the type is not valid raise an Error.

Additional Methods:

- **add_book**(book: Book): This method should take a Book object as a parameter and add it to the books list of the library.
- **remove_book**(title: str): This method should take a book title as a parameter and remove the book from the books list of the library, if it exists.

Extra Features:

- Add a **borrowed_books** attribute (dictionary) to keep track of books that are currently borrowed, along with the borrower's name and return date.
- Implement a method **borrow_book**(title: str, borrower_name: str, return_date: str) to allow a book to be borrowed from the library. The method should update the borrowed_books dictionary with the book's title, borrower's name, and return date.
- Implement a method **return_book**(title: str) to mark a borrowed book as returned in the borrowed_books dictionary.