Programmation orientée objet 2 (TP)
List And String Classes -- TP01 --

Create a **Library** class to manage books and readers.

Classes:

Book:

Attributes: Title, author, year published, genre (represented as a String)

Methods: Getters and setters for attributes, toString to print book details

Reader:

Attributes: Name, ID, borrowed books (a list of Book objects)

Methods: Getters and setters for attributes, borrowBook(Book), returnBook(Book), toString to print reader details

Library:

Attributes: List of books, list of readers.

Methods:

addBook(Book): Adds a book to the library

addReader(Reader): Adds a reader to the library

borrowBook(Reader, Book): Borrows a book for a reader if available

returnBook(Reader, Book): Returns a borrowed book

searchBook(String): Searches for a book by title

listReaders(): Prints details of all readers

listAvailableBooks(): Prints details of available books

toString to print library details.

String Library Documentation:

The **String** class in Java provides various methods for manipulating strings. Some relevant methods include:

length(): Returns the length of the string.

charAt(int): Returns the character at a specific index.

substring(int, int): Extracts a substring from the string.

toLowerCase(), **toUpperCase**(): Converts the string to lowercase or uppercase.

equals(String): Compares two strings for equality.

contains(String): Checks if a given substring exists in the string.

Lists Documentation:

Declaration:

List<DataType> listName = new LinkedList<>();

Adding Elements to a List:

- **Add a single element of any type:**

  DataType element = ...;
  listName.**add**(element);

- **Add multiple elements at once using a collection:**

  Collection<DataType> otherCollection = ...;
  listName.**addAll**(otherCollection);

Removing Elements from a List:

- **By index:**
  listName.**remove**(index);

- **By Element:**
  listName.**remove**(element);

- **By Predicate:**
  Removes all elements that match a given condition
  listName.removeIf(predicate);

- **Iterating and removing:**
  For more control, use a loop to iterate and remove elements based on specific criteria

Getting the size of a List:

```java
int size = listName.size();
```

We use lists in Java to store and manage collections of things in an organized and flexible way.