UNIVERSITI TEKNOLOGI MALAYSIA
Department of Computer Science
Faculty of Computing

Assignment 1

(Sorting & Searching Process)

Programme	:	Bachelor of Computer Science (*Data Engineering*)
Subject Code	:	SECJ2013
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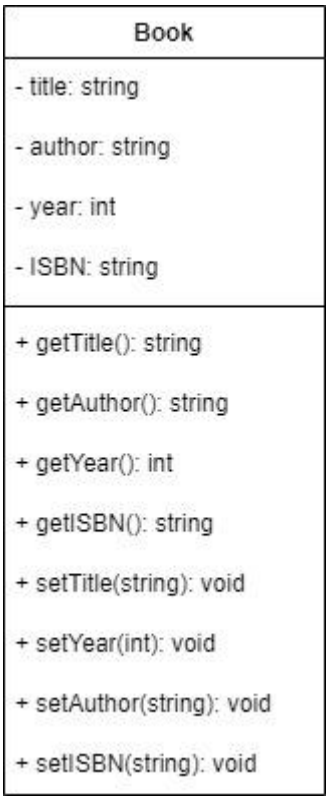
1. Objective

The objective of this project for Assignment 1 is to create a Library Management System that will enable the users to efficiently manage the list of books by sorting it by different attributes and searching for books based on certain criterias. The aim of this project is to provide a user-friendly and interactive interface that can help the users to manage their collection of books by organising it and finding specific books easier.

2. Synopsis

The Library Management System is a system that is designed to store information about different books which includes the title, author, publication year, and finally ISBN of the book. When using the system, users will be able to perform sorting and searching operations on the list of books to organise and find books that are within the system. We have made sure that the system can handle the task efficiently.

3. Class Design



4. Pseudocode

4.1. Start
4.2. Display Welcome Message
4.3. Prompt user to choose an option: Sorting, Searching, or Book List

4.4. If Sorting is chosen:
    4.4.1. Prompt user to select sorting criteria: Title, Author, Year, or ISBN
    4.4.2. Perform sorting based on the selected criteria
    4.4.3. Display the sorted list of books
4.5. If Searching is chosen:
    4.5.1. Prompt user to select search criteria: Title, Author, Year, or ISBN
    4.5.2. Perform searching based on the selected criteria
    4.5.3. Display the search results
4.6. If Book List is chosen:
    4.6.1. Read book details from the file
    4.6.2. Display the entire list of books
4.7. After executing the user's choice, prompt the user whether to continue using the program
4.8. If the user chooses to continue, go back to step 4.3
4.9. If the user chooses to exit, display a thank you message and end the program

5. Implementation of Sorting

In the program, sorting is implemented using straightforward algorithms, such as the bubble sort algorithm, for simplicity and ease of understanding. Each sorting function corresponds to a specific criterion: title, author, year, or ISBN. The sorting algorithms iterate through the array and compare adjacent elements, swapping them if they are out of order. This process is repeated until the entire array is sorted according to the chosen criterion.

6. Implementation of Searching

Searching is implemented using a linear search algorithm, where the program iterates through the array to find a match based on the user's input. Similar to sorting, searching functions are designed for specific criteria: title, author, year, or ISBN. For instance, the searchByTitle function prompts the user to enter a book title, and then it iterates through the array to find and display books with matching titles. Linear search is effective for small datasets and ensures that all matching elements are found.