

Indian Institute of Technology, Kharagpur
Department of Computer Science and Engineering
Software Engineering (CS 29006), Spring 2021

Assignment 1 – C++ Programming

Grading guidelines:

1. *Zero marks for a submission if it does not pass the plagiarism test.*
2. *Break-up of Credits will be as follows:*
 - (a) *Percentage of features implemented: 70%*
 - (b) *Aesthetics: 10%*
 - (c) *Whether reasonably able to answer questions: 20%*

Total marks: 70

A library of books contains many books. Each book is stored in a text file in a given directory, which contains the library. Each book has a title, an author, a release date, and a Language. These can be read from the Project Gutenberg file header, see for example the novel *Moby Dick* by Herman Hesse:

<https://www.gutenberg.org/files/2701/2701-0.txt>

The file header is given below for reference.

A book can contain many types of content, e.g. a novel, a play, etc. For this assignment, you need to implement a novel and play, but your software design should be such that other types of books can be easily added. A novel can contain many chapters. Each chapter has a title followed by many paragraphs. Each paragraph contains many sentences, and each sentence is a sequence of words. A play has a optional prologue followed by many acts. Each act has many scenes, and each scene is a sequence of dialogues. Additionally, a play also has a list of characters or personae, where each dialogue is spoken by a character.

Use case 1:

You have to create a Library management system (LMS) which manages all the books in a given directory. The program will start with a directory as input, and will manage the books in that directory. The LMS will maintain the type of each book in the library, in a file called “index.txt”. It should automatically detect all files in the directory and be able to detect the newly added books. It should then ask the user for type of each of the newly added books and add them to “index.txt”.

[20 marks]

Use case 2:

The LMS should have the following functionality:

1. List all books along with their filename, title, and author name.
2. Search for a book by its title or author name, and show the matching books as a list.
3. Display a book from any of the above two lists.

[20 marks]

Use case 3:

The LMS should be able to perform the following analytics tasks:

1. If the type of the selected book is novel, given an input word, the LMS should be able to show the top 5 chapters, or top 5 paragraphs, where this word appears most of the times.
2. If the type of the selected book is play, then given an input character, the LMS should show a list of all other characters which appear in at least one scene with the input character.

[20 marks]

10 marks for text based interface design.

Example Project Gutenberg file header:

The Project Gutenberg EBook of Moby Dick; or The Whale, by Herman Melville

This eBook is for the use of anyone anywhere at no cost and with almost no restrictions whatsoever. You may copy it, give it away or re-use it under the terms of the Project Gutenberg License included with this eBook or online at www.gutenberg.org

Title: Moby Dick; or The Whale

Author: Herman Melville

Release Date: December 25, 2008 [EBook #2701] Last Updated: December 3, 2017

Language: English

Character set encoding: UTF-8

*** START OF THIS PROJECT GUTENBERG EBOOK MOBY DICK; OR THE WHALE ***