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**HIMALAYAN WHITEHOUSE INTERNATIONAL COLLEGE  
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**A**

**Minor   
First Year Project Proposal**

**On**

**“LIBRARY MANAGEMENT SYSTEM”**

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# ABSTRACT

This project presents a library management system designed in a c programming. LMS is a software which is used in library to manage book, record and file in a systematic way. This system aims to manage library operation, add book, borrowing and returning book. This LMS software is addressing the problem of library which can face by librarian during managing books in library. The system provides easy interface for librarian to manage the library effectively. This is the small non graphical library management system which is used in small library, small office, and small school. This library management system facilitates the login system for admin to keep data secure. The main objective of this project is solving the problem of library management by adding the feature like borrowing book, returning book, and update book detail etc. Username and password are must be needed for login this system which can help to keep record confidential. The methodology used in developing in the LMS includes researching in the topic, collecting the problem or requirement, system designing, coding, implementation, and testing. We can use waterfall SDLC model for making this software. We are making this software totally feasible by the all accepts. The expected outcome of this project is a reliable library management system that can solve the problem of librarian by managing library in a systematic way and enhance the overall library experience for user and librarian.

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# LIST OF ABBREVIATIONS

|  |  |
| --- | --- |
| LMS | Library Management System |
| SDLC | Software Development Lifecycle |
| IDE | Integrated Development Environment |
| MINGW | Minimalist GNU For Windows |
| GNU | Gnu’s Not Unix |
| HTML | Hypertext markup Language |
| ID | Identity Document |

# CHAPTER 1: INTRODUCTION

## Background

This project is about a library management system designed in a c programming. It is used by librarian to manage the library using a computerized system where librarian can record various transaction like issues of books, addition of book, remove old books. Library. In this software we can add feature like add book, borrowing and returning book, remove book, update book detail, etc. This software is used in a school library, public library, office library etc.

This project main goal is making a computerized library management system which can help to manage library in the digital way. After making this system, this system directly help in the work of librarian. Librarian can easily control the transaction of books, add book detail, delete books, search books and keep books records. We are trying to make complete computerized LMS by using a c programming.

## Problem Statement

In the today world, many library can uses old type of data storage system in library which is not effective and more complicated to store data in library by a librarian. Many problem like file lost, file damaged, difficult to search book in library, cost and space spacing, security problem are faced by the library and librarian. So we can address these problem and decided to make a systematic and digitalized software which can help to easily maintain the library data in a single computer. This software is called is called library management system. LMS can solve all the problem which are faced by librarian to keep data in digital form. After using this software a single person can easily maintain the library and not needed to use paper for keeping records of library.

## Objectives

The main aim of our project is develop the library management system and to be familiar with feature of c programming. The specific objectives of this project are given below:

* To solve the management issues of library in digital way.
* To save cost and space of library.
* To keep data safe and secure.

## Scope of Project

The scope of library management system are listed below:

* This system is used in a library where librarian and other staff of library are used this system for managing a library.
* Keep data secure to using a specific password and username to operate this system.
* This system will provide an efficient and effective method for managing book record, transactions of books like issues and returning book, and any other confidential information.
* Addition, deletion, searching and viewing of books information are recorded by authorized administrators.

## Significance and Limitation

**Significance**

The significance of this project of this project are listed below:

* Library management system is needed in a school library which can solve the management problems of books.
* The goal of this project is solved the issues of library which is faced by the librarian in issues books, returning books, and keeping records.
* LMS provide a cost effective and time effective environment for the library staffs.

**Limitation**

There are some of the limitation which aren’t able to do in this project which are listed below:

* We are making library management system in a c program so it is complicated to add graphic in the software. So, it can less user friendly.
* C program is more complex to maintain, update, for any developer so any developer can fix the problem and update the system easily.
* Training is needed for new user because this system is complicated to use first time.
* C programs can be more complex to scale and maintain, especially for large and complex library systems with evolving requirements.

# CHAPTER 2: LITERATURE REVIEW

Some of the existing system ware manual there was no way of properly storing information. Library records were stored manually lead to errors and much paper work needed in the library to manage library records. Data are not properly secured. So there was the need to develop a system which could manage all these things and reduce the paperwork.

**2.1 Study of existing system**

According to the datim, Abir Roy and Nandita made a library management system in a HTML. They made a web based LMS where student can directly send request to issues book to librarian in online. Admin and student both needed a username and password to enter in the website. Student can login own ID and register new account. In this system all the transaction are done in online and admin can add and delete book through online. This project is done in HTML so they use graphic which can create easy interface between user and system. [1]

According to the ACADEMIA, Prabhakar kumar and Rahul make library management system using HTML. LMS is used by librarian and student to manage the library using a computerized system where he/she can record various transactions like issues of book, return of book, addition of book, deletion of book, addition of new student etc. They made a library management system for the student also. Student can apply request of book, register and login their own profile in this system. Register student can control the book transaction. Fee and fines are also calculate in this system. This is a web based LMS so graphics are also used in this system which help the user to operate this system. [2]

According to the researchgate, library management system is for monitoring and controlling the transaction of library. This project library management system is developed in HTML, CSS which mainly focuses on basic operation in a library like adding new books, and updating new information, searching books and members and returning books. This system is easy to operation and no paper work is needed. This is also an online management system many transaction are also done in online. The purpose of this system is systematic circulation of book and keeping record of transaction. [3]

According to the studocu, library management system is a project which aim in developing a computerized system to maintain all the daily work of library. HTML programming language is used to make this library management system. The whole system is worked by online every transaction of book are done by online in this system. This system has many feature which are generally not available in normal library management like facility of user login and a facility of admin login. It can also facilities the admin to monitoring the whole system and student can see their list of book issued and login their account. [4]

After studying about previous project we can address these problem and we will trying to solve these problem. This project have many new feature which are generally not available in the normal library management system like user login and a facility of admin login. No paper work is needed in this system where all data are saved in digital form. We are making a cost effective, time effective, and feasible library management system.

# CHAPTER 3: SYSTEM ANALYSIS

## 3.1 Requirement Analysis

Requirement analysis is the process of gathering, documenting, and analyzing requirements for a system to be developed. It is a crucial step in the software development lifecycle, as it helps ensure that the final product meets the needs and expectations of its users. Library management system is a small project. It is used only for small places so we need Dev C++ software for making this system. Mingw software is needed for change the code in binary form and operate this system. This software is only for small purpose so we don’t need large database we can store data in own computer storage device.

**3.1.1 Functional Requirements:**

It describe the specific functions that the system must be performed:

* **User authentication:**

The system should allow to user to securely login after using a username and password.

* **Library management:**

The system should provide functionality for adding, updating, editing and deleting books records.

**3.1.2 Non-Functional Requirements:**

Outline the quality attributes and constraints that the system must adhere to. These could include performance, reliability, usability, security, etc.

* **Efficiency requirement:**

When a library management system will be implemented in digital system librarian can easily access library as searching and book transaction will be very faster.

* **Performance:**

The system should respond to user inputs within 2 seconds under normal load conditions.

* **Security:**

Confidential information’s are operated only by an admin. So, data are secured and confidential.

* **Usability:**

Usability is the main non-functional requirement for a library management system. The UI should be simple enough for everyone to understand and get the relevant information without any special training.

* **Accuracy:**

Accuracy is another important non-functional requirement for the library management system. This system can store exact data if we can store right data, transaction process is accurate every time.

* **Availability:**

The System should be available for the duration when the library operates and must be recovered within an hour or less if it fails. The system should respond to the requests within two seconds or less.

* **Maintainability:**

The software should be easily maintainable and adding new features and making changes to the software must be as simple as possible. In addition to this, the software must also be portable.

## 3.2 Feasibility study

## 3.2.1 Technical Feasibility:

We can strongly say that it is technically feasible, since there will not be much difficulty in getting required resources for the development and maintaining the system as well. All the resources needed for the development of the software are easily available. So we can say our upcoming project is fully technically feasible.

## 3.2.2 Operational Feasibility:

Operational feasibility studies also examine how a [project plan](https://www.simplilearn.com/project-management-plans-in-project-environment-rar79-article) satisfies the requirements identified in the requirements analysis phase of system development and also determine the methodology that fulfil your objectives or not. LMS is an operational feasible. This system is made in a low-level programming language (C programming). This system is made for small intuition so for this system there is no needed to high database and high-level operating system. This system satisfies the requirement so we can say LMS is technical feasible.

## 3.2.3 Legal Feasibility:

This software is fully legal feasible by all aspect. Library management software follow the whole rule and regulation of cyber law and social media law. It can protect data confidential. In this software we keep our simple data like name, address, phone no, roll no, etc.

## 3.2.4 Economic Feasibility:

For the development of this application is highly economically feasible. Organization not needed to spend much money for developing this software. We are making this project for the educational so no money needed in the making of the project.

## 3.2.5 Scheduling Feasibility:

This project can take time about 12 weeks to 15 weeks to complete this project. This time is sufficient for develop this software and make a project.

**Project Scheduling**

Our Project life-cycle took over weeks of scheduling which are as listed

The following figure shows the project-scheduling in diagram:

|  |  |
| --- | --- |
| * **Month 1:** | Selecting title & Project study |
| * **Month 2:** | Planning and research |
| * **Month 3:** | Product requirement analysis |
| * **Month 4:** | System deigning |
| * **Month 5:** | Coding and testing |
| * **Month 6:** | Documentation |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 |
| Title selecting and project study |  | | | | | |
| Planning and research |  | | | | | |
| Product requirement analysis |  | | | | | |
| System degining |  | | | | | |
| Coding and testing |  | | | | | |
| Documentation |  | | | | | |

*Fig: Project-Scheduling Gant chart*

# CHAPTER 4: SYSTEM DESIGN

## 4.1 Software development life cycle

The Software Development Life Cycle (SDLC) is a structured process used in software development projects to ensure high-quality software is produced within the constraints of time and budget. This proposal outlines the implementation of a C programming project using the SDLC model.

The Software Development Life Cycle (SDLC) is a framework that defines tasks performed at each step in the software development process. It consists of several phases including planning, requirements gathering, design, implementation, testing, deployment, and maintenance. Each phase has its own set of activities and deliverables, ensuring the systematic progression of the project from inception to completion.

## 4.2 Selected Model

For this C programming project, we have chosen the Waterfall Model. The Waterfall Model is particularly suitable for projects where requirements are well-defined and unlikely to change significantly throughout the development process. Here are the reasons behind selecting the Waterfall Model:

1. **Stability of Requirements:**

The Waterfall Model assumes that requirements are stable and can be fully defined at the beginning of the project. This model is suitable for projects where there is a clear understanding of what needs to be developed, and changes to requirements are minimal.

1. **Sequential Progression:**

The Waterfall Model follows a sequential progression of phases, with each phase building upon the deliverables of the previous one. This approach provides a clear structure and roadmap for the project, making it easier to plan and manage.

1. **Well-Defined Deliverables:**

The Waterfall Model defines specific deliverables for each phase, making it easier to track progress and ensure that all requirements are met. This model emphasizes documentation, ensuring that requirements, designs, and test cases are well-documented throughout the development process.

## 4.1 Algorithm

## Step1: Start the software

* Two login options are displaying i.e. login, exit.
* In login if username and password are correct then the user can enter the menu. If username and password are not matched the re-enter option is given.
* In exit program is terminated.

**Step 2:** Display menu to choose the faculty

* Enter 1 for library management.
* Enter 2 for exit.

**Step 3:** If enter 1

* Enter 1 for issues book.
* Enter 2 for return book.
* Enter 3 for search book.
* Enter 4 for update book list.
* Enter 5 change setting.
* Enter 6 for exit.

If enter 1

(Giving book)

* + Enter book name.
  + Enter student name.
  + Enter issues date.
  + Enter return date.

If enter 2

(Return book)

* Enter book name.
* Enter student name.
* Print message does you want to add book in list[y/n]. Press y for yes and n for no.

If enter 3

* Enter book name or book no.

If enter 4

* Enter 1 for add book.
* Enter 2 for delete book.
* Enter 3 for see book list.
* Enter 4 for exit.
  + If enter 1
    - Enter book name.
    - Enter author name.
    - Enter publication name.
    - Enter add date.
  + If enter 2
    - Enter book name.
    - Print message does you want to delete book [y/n].
  + If enter 3
    - See book list.
  + If enter 4
    - Exit program.

If enter 5

* Change password

Enter old password

Enter new password

Re-enter new password

(Password change successfully)

* Change username

Enter old username

Enter new username

Re-enter new username.

* Log out

If enter 6

* Program exit.

If enter 2

* Program exit.

## 4.3Flowchart

Welcome

n=1

Welcome user

Read username and password

Login

Yes

No

Opt 1

Display menu

1. Issues book
2. Return book
3. Search book
4. Update book
5. Setting
6. Exit

Opt 2

Issues book

1. Enter 1 for LMS
2. Exit

Welcome to library management system

Opt 1

Program terminated

Yes

No

No

Yes

Yes

Yes

Opt 3

Enter book name, student name

Return book

Enter book name, student name, giving date, return date

Search book

Update book

Opt 2

Enter book name or book no

Opt 4

Yes

No

No

Display menu

1. Add book
2. Delete book
3. See book list
4. Exit

Add book

Enter book name, publication name

Opt=1

Opt=2

Delete book

Enter book name

No

Yes

No

Yes

No

Opt=3

See book list

Opt=4

Exit

Opt 5

Display menu

1. Enter 1 for change password
2. Enter 2 for change username
3. Enter 3 for exit.

Read opt

Opt 1

Change password

Yes

No

Yes

Yes

No

Opt 2

Opt 3

Change username

Exit

Exit

**Figure 1: Flowchart**

## 4.4 Use Case diagram:

Admin

**Fig 4: Use case diagram**

## CHAPTER 5: IMPLEMENTATION AND TESTING

## 5.1 Implementation

### 5.1.1 Tools Used

The whole project is deigned in c programming which is coding in the Dev C++. The project relies heavily on the C programming language for its strength and efficiency in system-level programming. C offers direct access to system resources, making it an ideal choice for projects where performance and control are paramount. For development, the project utilizes Dev-C++, an integrated development environment (IDE) that provides essential features for writing, compiling, and debugging C programs. Its intuitive interface and simplicity make it suitable for developers of all skill levels. Dev-C++ also offers built-in debugging tools, allowing developers to identify and rectify bugs efficiently. With features such as breakpoints, variable inspection, and step-through execution, debugging becomes a streamlined process within the IDE.

The MinGW (Minimalist GNU for Windows) compiler, bundled with Dev-C++, handles the compilation of C code into executable binaries compatible with the Windows environment. This compiler ensures that the project's code is translated efficiently into machine language.

To save data permanently we can also use the notepad. NOTEPAD is a simple text editor application that allows users to create and edit plain text files. It is a lightweight program typically included with the windows operating system. Notepad’s interface is minimalistic, with basic feature for entering, editing and saving text. It doesn’t support formatting such as bold or italics, nor does it include advanced features like spell check or grammar check.

After we download and setup Dev C++, Mingw and notepad software now we will start creating our project.

## 5.2 Testing

Testing is an integral part of ensuring the quality and reliability of the project. The aim of the system testing process was to determine all defects in our project.

The following testing methods are employed:

1. **Unit Testing:**

Individual functions or modules are tested in isolation to validate their correctness and functionality. Dev-C++ provides built-in support for unit testing, enabling developers to verify the behavior of each code unit independently. This system is operated only by admin.

* **Test for the admin module**
* **Testing admin login form**:

This form is used for log in of administrator of the system. In this we enter the username and password if both are correct menu become displayed otherwise give the option of re-enter password and username or exit the program.

* **Book transaction:**

Admin should enter detail of student, issued date, return date, and book detail.

1. **Integration Testing:**

In this type of testing we test various integration of the project module by providing the input. The primary objective is to test the module interfaces in order to ensure that no errors are occurring when one module invokes the other module.

* Verify that different modules and components of the LMS work together seamlessly.
* Test data flow and interactions between various parts of the system.

1. **System Testing**:

The software is tested as a whole to verify its compliance with specified requirements and assess its overall functionality. Dev-C++ enables system testing by executing the entire application and validating its behavior under different scenarios and input conditions.

**Iv. Regression Testing:**

The software is tested as a whole to verify its compliance with specified requirements and assess its overall functionality. Dev-C++ enables system testing by executing the entire application and validating its behavior under different scenarios and input conditions.

# CHAPTER 6: EXPECTED OUTCOME

Library Management System (LMS) plays a crucial role in the efficient operation of library’s by automating various process involved in issues book, return book, save data of book, search and delete the book. This system can update library in computerized system. This system integrates technology to streamline library operations, enhance customer service, and ensure regulatory compliance.

Expected Outcome for library Management System:

* + 1. **User Authentication and Authorization:**
* Implement functions for verifying username-password authentication.
* Optionally, incorporate two-factor authentication mechanisms.
* Implement role-based authorization to restrict access to specific functionalities.
  + 1. **Analysis material:**
* Tracking of library materials, including availability and location.
* Manage the library in a proper way.
  + 1. **Transaction Processing:**
* Implement functions for processing various types of transactions such as book transaction, deposits books, see book list, add new book and remove old book, search book.
* Validate transaction details and update book list accordingly.
* Generate transaction of book receipts for customers as needed.
  + 1. **Security and Compliance:**
* Implement measures to protect user data and library resources.
* Implement security measures to protect against unauthorized access, and cyber threats.
  + 1. **User Interface and Experience:**
* While C programs typically lack graphical user interfaces, you can design a simple text-based interface with clear prompts and options.
* Implement intuitive navigation and informative messages to enhance user experience.
* For advanced interfaces (e.g., online library management system, mobile apps), you may consider integrating C code with other technologies or platforms.

# CHAPTER 7: CONCLUSION AND DISCUSSION

**1. Summary of Findings**

The proposal aims to develop a library Management System using C programming. The system will encompass functionalities including transaction of book, returning of book, add new book, remove old book, save transaction data and book data. The proposed system will provide a user-friendly interface for both customers and administrators, facilitating efficient library operations. The project plan outlines the steps required for development, testing, and implementation of the system, with the goal of delivering a robust and reliable solution to meet the library needs effectively.

**2. Proposed Key Achievements and Contributions**

The Proposed key achievements of this project include:

* Designing and implementing a robust library management system in C programming language.
* Ensuring data security through password encryption and secure transaction of book.
* Providing easy and comfortable experience for librarian to handling the library.
* Developing a modular and scalable system architecture, allowing for future expansions and updates.

**3. Limitations and Challenges**

In the course of development, we anticipate encountering several challenges and limitations, which include:

* Limited user interface capabilities stemming from the command-line nature of the application, potentially hindering user interaction.
* Identification of potential security vulnerabilities, particularly concerning the handling of sensitive customer data, necessitating robust security measures.
* Absence of real-time transaction processing, which may affect the system's responsiveness, particularly during periods of high usage.
* System can be used by only admin. User have no permission to operate this system. Transaction of book aren’t online.

**4. Significance of the Project**

The proposed of library management system holds the significant promise for modern library operations, offering a foundational framework for efficient management of transaction of book, data of book and customer data. Furthermore, the utilization of the C programming language underscores its adaptability in constructing robust and high-performing systems, particularly in resource-constrained environments.

**5. Conclusion**

In conclusion, the proposed development of the library management system using C programming presents an invaluable learning opportunity. While challenges have been acknowledged, the project aims to deliver a functional and scalable library solution. Moving forward, continued efforts will focus on addressing identified limitations and implementing enhancements to ensure the system remains pertinent and efficient in meeting the dynamic requirements of the library sector.

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