AUTOMATED LIBRARY MANAGEMENT SYSTEM

BY

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ID: 163-15-8469

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

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DHAKA, BANGLADESH

APPROVAL

This Project titled "Automated Library Management System", submitted by Md. Ashikuzzaman, ID No: 163-15-8469 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 03/06/21.

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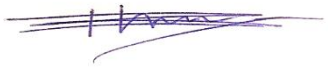

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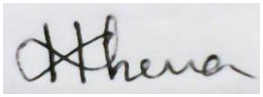

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DECLARATION

I hereby declare that, this project has been done by us under the supervision of Md. Sadekur Rahman, Assistant Professor and Department of CSE Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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I also like to express our heartiest gratitude to **Professor Dr. Touhid Bhuiyan Head of the Department of Computer Science and Engineering** and other faculty members and the staff of CSE Department of Daffodil International University.

Finally, I must acknowledge with due respect the constant support and patience of our parents.

1.2 MOTIVATION

Behind my project many things motivated me. Before library management system whole the process of library system was manually. So taking more time for an information collect like borrow a book or return a book and also search of books and members. And major problem is that to prepare the list of books, user registered and borrowed the books will take more time. But now automated library management system doing as a one-day process for verify all records. It helps user to find book list easily and thus saving time. So I decided automated library management system through web based application is the best application for library management system.

ABSTRACT

I have developed an automated library management system. Because the previous library management system was manually in which storing all the information was very difficult and took a lot of time. Also the chances of mistakes are very high. Since paper information has to be stored manually the paper lost possibility are very high. But my project automated library management system information is stored very easily. And data can be stored in a very short time. Also chances of mistakes are much lower. Automated library management system store as much information if admin want. Also benefits user can search the books by book title, author name and ISBN number. When the book is available user easily borrowed the books and returned the book easily.

So I would say automated library management system is very help full for user and librarian.

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CHAPTER 1
Introduction

1.1 Introduction

A library is a place where all category books are stored. Automated library management system is a web based application where all category book information is recorded. And also recorded user information. But must be registration user by academic ID card. Librarian manages books and students and also can extend the time of issued books. The user can search for books and view the book availability. They can search books by book name, author name and ISBN number. Also they can see their own transactions. Thus the management can take appropriate steps to improve the facilities.

1.3 Objectives

- To handle the entire activity of a library.
- To have more timely information.
- To have entire control over the library operations.
- To provide various search options like book title, author and ISBN number.
- To develop and update database of books.

1.4 Expected Outcome

Automated library management system that helps university library system. And also helps user and librarian like a friendly. And also easily understand basic features and function of library management system. Automated library management system keep's record users and the books. This system supports whole the user transaction process.

So I would say automated library management system expected outcome overall is good.

1.5 Report Layout

The following is a list of the contents of this project:

a. Chapter one explains introduction the project motivation, objectives and expected outcome
b. Chapter two discuss about project background introduction, related work, comparative analysis and summary, scopes of the problem and challenges
c. Chapter three contains use case diagram, use case model and description, business process model, requirement collection and analysis
d. Chapter four covers front end design, back end design, implementation requirements
e. Chapter five implementation of database, implementation of front end
f. Chapter six cover project conclusion and future scope

CHAPTER 2
Background Study

2.1 Introduction

Automated library management system is a web based application. There is more collection of books. When the students and the faculties issue the books for their academic id card. But the maintenance of keeping systems librarian. The librarian records the books, issue the books and return the books. The library management system will be very useful. The system helps both students and librarian see the book list available in the library. The system necessary for university to keep a continuous check on the books issue and return and also calculate fine. This system no chances of mistakes.

2.2 Related Work

There are many library management projects. But my projects user can easily search the books by Book title and ISBN numbers. And user pays the fine. The user extends book time for a few days. And the admin feature allows to add new books to the library functions.

Table 2.2 Related Work Others Project

Topic	Digital library management system	Online library management system	Library management system	Automated library management system My Project
User	Yes	Yes	Yes	Yes
Librarian	Yes	Yes	Yes	Yes
Late Fine	Yes	No	No	Yes
Reserve Books	No	No	Yes	Yes
Event Addition	No	Yes	No	No
Teacher Login	No	Yes	Yes	No
Issue Books And Return Books	Yes	Yes	Yes	Yes

Librarian: Librarian add and modify books items, add members and also issue the books and return the books.

User: User can search the books by book title, author and ISBN number. And see the transaction

System: The system to send notifications in regard to overdue books.

Add books: Here the book items added and remove the book items.

Search Catalogue: Here the user and admin search the book item by book title.

Registration new members: Here admin registration new members and cancel the membership.

Check out books: User and admin check out the books.

Reserve books: Admin can reserve the book currently unavailable.

Book renewal: Admin can extend the book time

Return books: User can return the books when issue to the library

2.3 Comparative Analysis and Summary

Automated library management is web based application which contains to library whole system. It is used librarian to manage the library using computerized system where he can add new books, delete books, add new members, delete members. Books and users' maintenance modules are also including in this system. With the computerized system there will be no loss of books records or user records which generally happens when a non-computerized system is used. All these modules are able to help librarian to manage the library management system.

2.4 Scope of the Problem

Automated library management system is a web based application. Html and PHP used to write the whole code and web pages with Bootstrap (CSS) Java script for styling it is the lengthy process of website.

2.5 Challenges

- To collect data
- Ensure security for the users
- Ensure the front end designed
- Select the project title
- Ensure the user interface designed
- Takes a lot of time

CHAPTER 03

Requirement Specification

3.1 Use case diagram

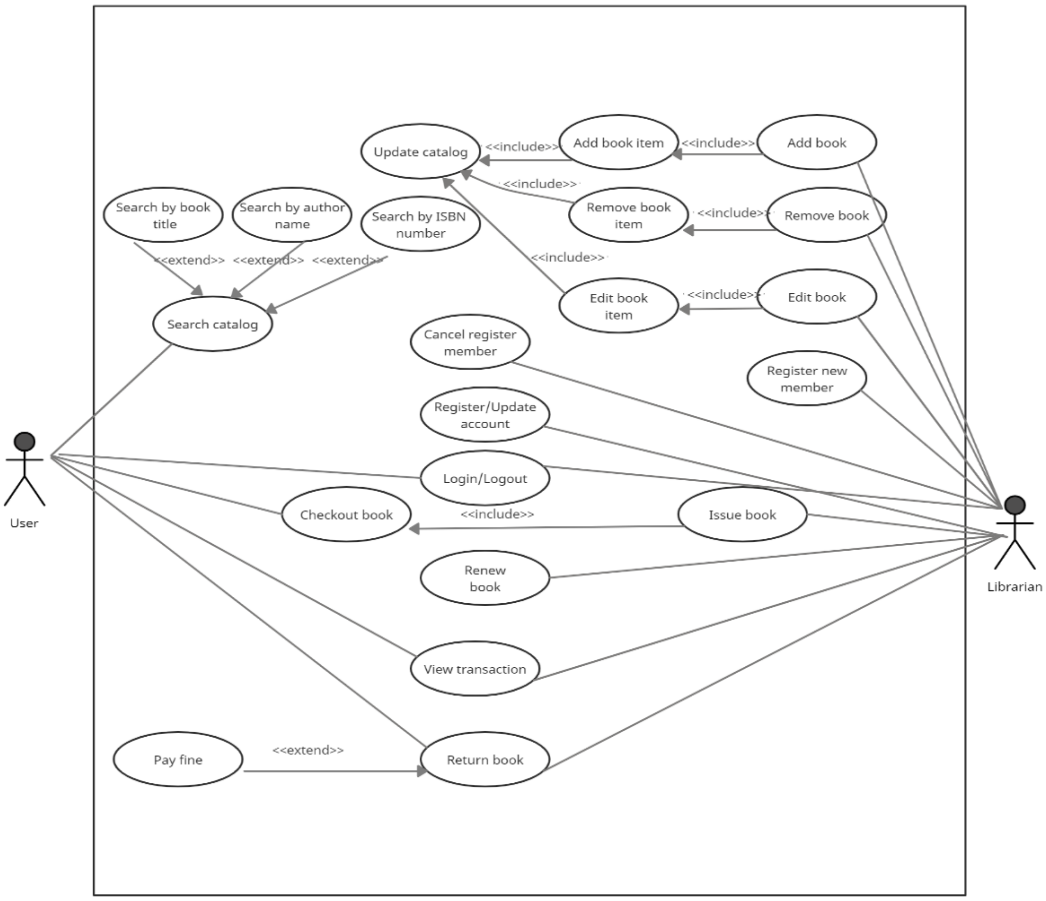


Fig-3.1: Use case diagram

A use case diagram is graphical depiction of a user's possible interactions with a system. The user can see the search catalog, checkout book, login and view transaction. Admin can maintain add book, delete book, issue book, registration new members, renew book, view transaction and fine method.

3.2 Use Case Modeling and Description

Profile

- User Model
- Admin Model

User Model

- **Log in:** User login into system academic ID card and view the transaction and search the books. By Book title and ISBN number.
- **Checkout Book:** User can check out the book.
- **Borrow Book:** The user can see borrowed the book
- **Return Book:** The user can see returned the book
- **Logout:** The user can logout the system

Admin Model

- **Admin Login:** The admin login into system but must be enter user id and password before they are allowed to enter the system
- **Add Book:** Admin add new books to the library
- **Remove Book:** Admin remove books to the library
- **Add Member:** Admin add new members
- **Delete Member:** Admin can delete the members
- **Issue Book:** Admin can issue the books.
- **Extend Time:** Admin can extend the book time.
- **Renew Book:** Admin can renew the book
- **View Transaction:** Admin can see the view transaction
- **Fine:** Admin can see the fine
- **Logout:** Admin can logout the system

3.3 Business process model

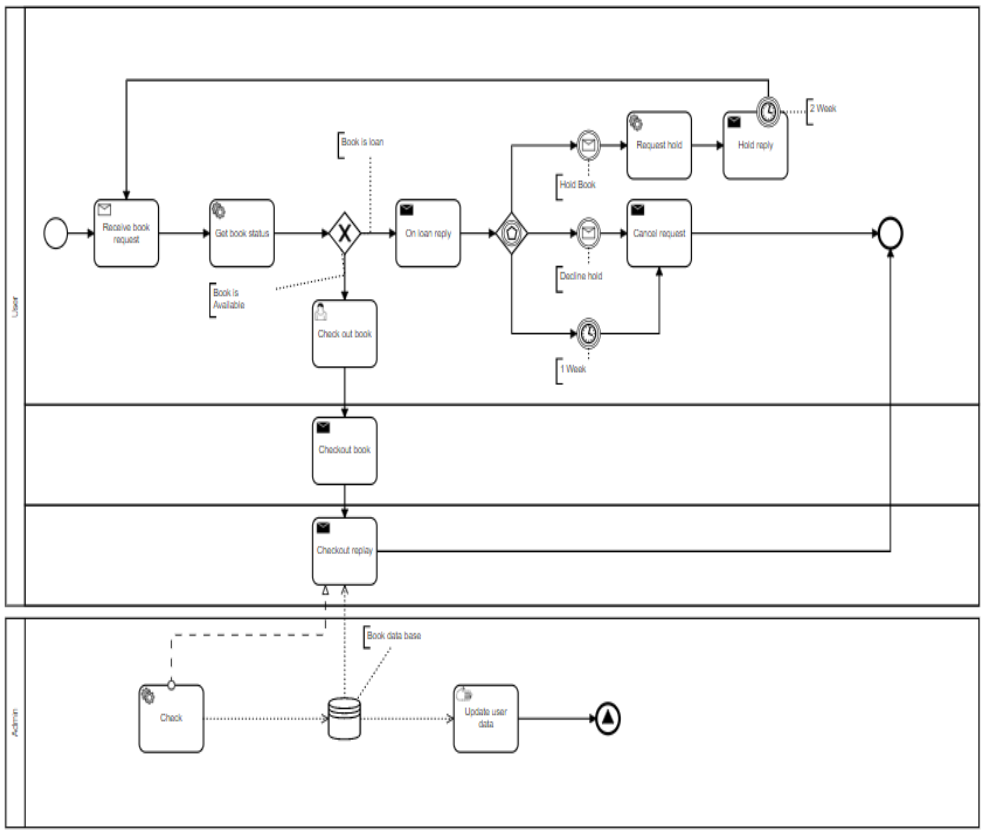


Fig-3.3: Business process model

Business process model is the graphical representation of a project process. It is usually different type graphing methods, such as flowchart, data-flow diagram etc.

This system used by the user to login into system. Admin are required to enter user id and password before they are allowed to enter the system. This system can be performed by all users to register new user to create account. This system allows add new books to the library.

3.4 Requirement Collection and Analysis

Software Requirements

- **Operating system:** Windows 10
- **Database MYSQL:** MYSQL is used as database as it easy to maintain and records by simple.
- **Language:** HTML is used to write the whole code and develop webpages with CSS, Java Script for styling work and PHP.
- **Tools:** Atom, Sublime Text 3, Notepad.
- **Internet Browsers:** Microsoft Edge, Firefox, Chrome.
- **Network:** Wi-Fi or Cellular Network
- **Logo:** Font Awesome

Hardware Requirements

- **Intel core i3**: Intel core i3 6th generation
- **Ram:** Ram 4 GB
- **Hard Disk:** Hard Disk minimum 100 GB

Functional Requirements

- User interface UI.
- To see this site need Wi-Fi or cellular network
- MySQL that stores the data or information to be displayed to the user.
- Good device to view first load page.

CHAPTER 04

Design Specification

4.1 Front end design

The whole project divide in two parts the front end and the back end. The front end is designed using of Html, PHP, CSS, Java script. Front end design is most important part of application. Because of system front end design is beautiful and user friendly.

Here is my system front end design activity:

Table: 4.1 System activity table

1.User book search screen
2.User transaction screen
3.User logout screen
4.Admin login screen
5.Dashboard screen
6. Book list screen
7.Member list screen
8.Borrow book screen
9. Return book screen
10.Category screen
11.Department screen
12.Payment method screen
13. Logout screen

4.2 Back end design

We know backend consist three parts a server an application database. Mainly my site is a dynamic and I run this in local server.

I used to build and run my site by XAMPP local server

Here is my project database

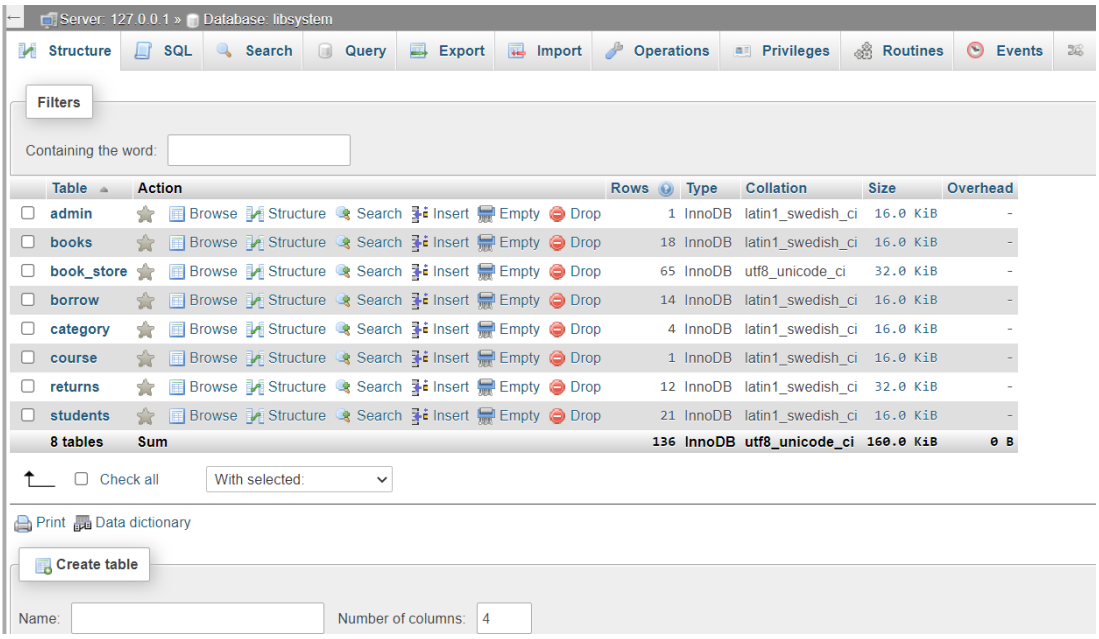


Fig: 4.2 DBMS system table

DBMS system table: The project mainly uses programming and SQL server for database storage. Admin only that person can operate the systems who knows the ID and Password of the valid user of the system of the valid user of the system.

4.3 Implementation Requirements

Frontend

Requirement Specification

- HTML
- CSS
- BOOTSTRAP
- JAVASCRIPT
- FONTAWSOME

Backend

- PHP

Server

- XAMMP
- MYSQL
- PHPMYADMIN

Tools

- Sublime text
- Atom
- Notepad

CHAPTER 5

Implementation and Testing

5.1 Implementation of Database

We know project database is the main part website where all data is store. I use MySQL database system.

Here is my database implementation:

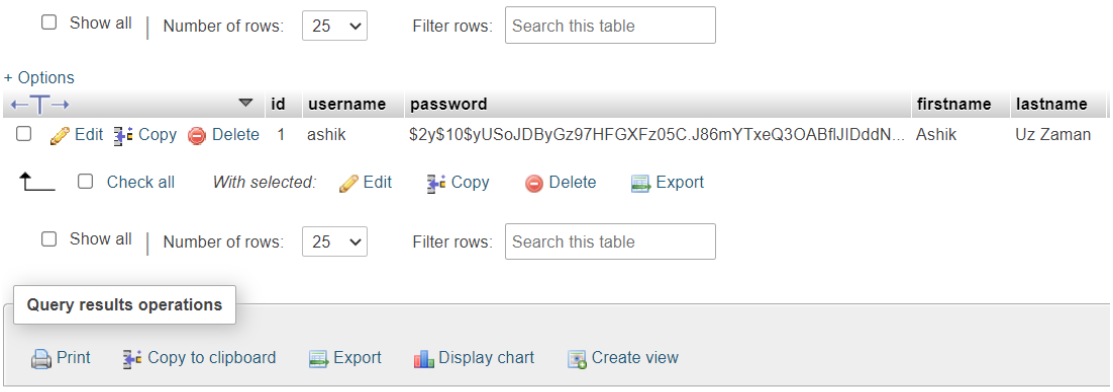


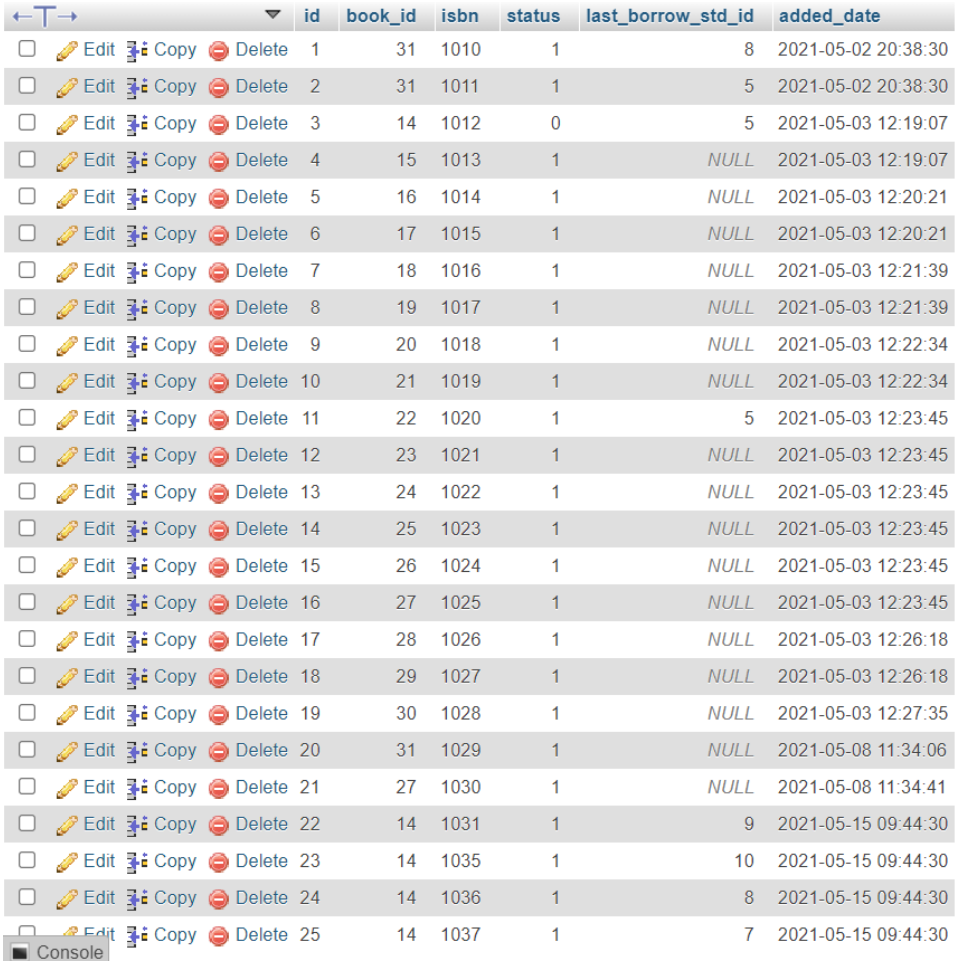
Fig-5.1: Admin table implementation

Admin table: Admin table used create the admin user name and password. Admin must be login to the system their own user name and password. For some reason admin forget password he recover the password. Only admin can maintenance whole the process.

	id	isbn2	category_id	title	author	publisher	publish_date	status
Edit Copy Delete	14	1001	1	Computer Fundamentals	Dhanpat Rai	Author Me	2021-04-26	1
Edit Copy Delete	15	1010	2	Calculus-II (Differential, Integral & Vectors)	Dewan Abdul Kuddus	Titas Publications	2021-04-26	1
Edit Copy Delete	16	1002	1	Programming and Problem Solving	Herbert Schildt.	Berkeley, Calif	2021-04-26	0
Edit Copy Delete	17	1003	1	Discrete mathematics	Richard Johnsonbaugh	India : Pearson education	2021-04-26	0
Edit Copy Delete	18	1004	1	Electronic circuit analysis and design	Donald A. Neamen.	Tata McGraw-Hill,	2021-04-26	0
Edit Copy Delete	19	1011	2	Engineering mathematics	Sastry, S. S.	New Delhi: Prentice Hall	2021-04-26	0
Edit Copy Delete	20	1005	1	Distributed algorithms	Nancy A. Lynch.	San Francisco, Calif.	2021-04-26	1
Edit Copy Delete	21	1012	3	Statistic and Probability	Mosteller, Frederick	London : Addison-Wesley,	2021-04-26	0
Edit Copy Delete	22	1006	1	Data communications	Houston H. Carr, Charles A. Snyder.	Boston : McGraw-Hill Irwin,	2021-04-26	0
Edit Copy Delete	23	1007	1	computer networks	Fred Halsall.	New Delhi : Pearson Education	2021-04-26	0
Edit Copy Delete	24	1008	1	Operating systems	Andrew S. Tanenbaum, Albert S. Woodhull.	New Delhi : Prentice-Hall of India,	2021-04-26	1
Edit Copy Delete	25	1009	1	Software engineering	Lan Sommerville.	New Delhi : Pearson Education	2021-04-26	1
Edit Copy Delete	26	1013	1	Artificial Intelligence.	Martha E. Pollack.	San Francisco, CA	0000-00-00	0
Edit Copy Delete	27	1014	1	Simulation and modeling	Averill M. Law	Boston : McGraw-Hill,	2021-04-27	0
Edit Copy Delete	28	1015	1	Computer graphics	Donald Hearn	New Delhi : Prentice-Hall of India	2021-04-27	0
Edit Copy Delete	29	1016	1	Embedded systems	Arnold Berger.	New York : Distributed in the U.S. and Canada by P...	2021-04-27	0
Edit Copy Delete	30	1017	1	Introductory robotics	J M Selig	New York : Prentice Hall,	2021-04-27	0
Edit Copy Delete	31		1	Economic	Niall Kishtainy	Author Me	2021-05-12	0

Fig-5.2: Books table implementation

Books table: Books table only admin can access. Admin can add the books, edit the books, remove the books and reserve the books. If the admin wants to add a book must be add book title, ISBN number and author name also publication date.



	id	book_id	isbn	status	last_borrow_std_id	added_date
Edit Copy Delete	1	31	1010	1	8	2021-05-02 20:38:30
Edit Copy Delete	2	31	1011	1	5	2021-05-02 20:38:30
Edit Copy Delete	3	14	1012	0	5	2021-05-03 12:19:07
Edit Copy Delete	4	15	1013	1	NULL	2021-05-03 12:19:07
Edit Copy Delete	5	16	1014	1	NULL	2021-05-03 12:20:21
Edit Copy Delete	6	17	1015	1	NULL	2021-05-03 12:20:21
Edit Copy Delete	7	18	1016	1	NULL	2021-05-03 12:21:39
Edit Copy Delete	8	19	1017	1	NULL	2021-05-03 12:21:39
Edit Copy Delete	9	20	1018	1	NULL	2021-05-03 12:22:34
Edit Copy Delete	10	21	1019	1	NULL	2021-05-03 12:22:34
Edit Copy Delete	11	22	1020	1	5	2021-05-03 12:23:45
Edit Copy Delete	12	23	1021	1	NULL	2021-05-03 12:23:45
Edit Copy Delete	13	24	1022	1	NULL	2021-05-03 12:23:45
Edit Copy Delete	14	25	1023	1	NULL	2021-05-03 12:23:45
Edit Copy Delete	15	26	1024	1	NULL	2021-05-03 12:23:45
Edit Copy Delete	16	27	1025	1	NULL	2021-05-03 12:23:45
Edit Copy Delete	17	28	1026	1	NULL	2021-05-03 12:26:18
Edit Copy Delete	18	29	1027	1	NULL	2021-05-03 12:26:18
Edit Copy Delete	19	30	1028	1	NULL	2021-05-03 12:27:35
Edit Copy Delete	20	31	1029	1	NULL	2021-05-08 11:34:06
Edit Copy Delete	21	27	1030	1	NULL	2021-05-08 11:34:41
Edit Copy Delete	22	14	1031	1	9	2021-05-15 09:44:30
Edit Copy Delete	23	14	1035	1	10	2021-05-15 09:44:30
Edit Copy Delete	24	14	1036	1	8	2021-05-15 09:44:30
Edit Copy Delete	25	14	1037	1	7	2021-05-15 09:44:30

Console

Fig-5.3: Book-store table implementation

Book-store: Book store where books are stored. When user wants to borrow books and return books also register lost book. It is whole process under book store. Only admin can accessed the book store.

	id	student_id	book_id	isbn	date_borrow	status	due_date
Edit Copy Delete	1	5	31	1010	2021-05-03	1	2021-05-10
Edit Copy Delete	2	5	31	1011	2021-05-03	1	2021-05-10
Edit Copy Delete	3	8	31	1010	2021-05-04	1	2021-05-07
Edit Copy Delete	4	34	14	1012	2021-05-16	1	2021-05-15
Edit Copy Delete	5	5	14	1012	2021-05-15	1	2021-05-22
Edit Copy Delete	6	8	14	1036	2021-05-15	1	2021-05-22
Edit Copy Delete	7	7	14	1037	2021-05-15	1	2021-05-22
Edit Copy Delete	8	10	14	1035	2021-05-15	1	2021-05-22
Edit Copy Delete	9	9	14	1031	2021-05-15	1	2021-05-15
Edit Copy Delete	10	5	22	1020	2021-05-16	1	2021-05-14
Edit Copy Delete	11	5	14	1012	2021-05-16	0	2021-05-23
Edit Copy Delete	12	5	22	1020	2021-05-16	1	2021-05-23
Edit Copy Delete	13	5	26	1065	2021-05-16	1	2021-05-23
Edit Copy Delete	14	5	26	1065	2021-05-22	0	2021-05-29

Fig-5.4: Borrow table implementation

Borrow table: Borrow table means the total number of books borrowed by the user. And also show the borrow books date and due books date and show the status .When user want to borrow a book admin needs user academic ID card. Then admin scan books ISBN number and record the system and provide the books.

	id	name
Edit Copy Delete	1	Engineering
Edit Copy Delete	2	Mathematics
Edit Copy Delete	3	Science and Technology
Edit Copy Delete	4	History

Fig-5.5: Category table implementation

Category table: Category table means which department books are available in library book store.

	id	student_id	book_id	isbn	date_return
Edit Copy Delete	1	5	31	1010	2021-05-03
Edit Copy Delete	2	5	31	1011	2021-05-03
Edit Copy Delete	3	34	14	1012	2021-05-05
Edit Copy Delete	4	5	14	1012	2021-05-15
Edit Copy Delete	5	8	14	1036	2021-05-16
Edit Copy Delete	6	8	31	1010	2021-05-16
Edit Copy Delete	7	7	14	1037	2021-05-25
Edit Copy Delete	8	10	14	1035	2021-05-25
Edit Copy Delete	10	9	14	1031	2021-05-16
Edit Copy Delete	11	5	22	1020	2021-05-16
Edit Copy Delete	12	5	26	1065	2021-05-16
Edit Copy Delete	13	5	22	1020	2021-05-30

Fig-5.6: Returns table implementation

Return table: When the user borrowed the book then he returned the book at the end of his need. Return table show the total number of books returned by the user. Return table show the books ISBN number which return the book and also show the return date.

	id	student_id	firstname	lastname	photo	course_id	created_on
Edit Copy Delete	5	163-15-8469	Md.Ashik	Uz Zaman	ashik.jpg	2	2021-04-03
Edit Copy Delete	7	163-15-8453	Md. Saiful	Islam	saiful.jpg	2	2021-04-26
Edit Copy Delete	8	163-15-8264	Muhtasim	Mahin		2	2021-04-26
Edit Copy Delete	9	163-15-8470	Shaibal	Barmon		2	2021-04-26
Edit Copy Delete	10	163-15-8474	Asadul Islam	Saju		2	2021-04-26
Edit Copy Delete	11	153-15-6674	Nawshin	Sultana		2	2021-04-26
Edit Copy Delete	12	151-15-4696	Tushar	Dewan		2	2021-04-26
Edit Copy Delete	13	151-15-4934	Md.	Wahiduzzaman		2	2021-04-26
Edit Copy Delete	14	161-15-6775	Md.	Mahadi Hasan		2	2021-04-26
Edit Copy Delete	15	161-15-6847	Pijush	Sarkar		2	2021-04-26
Edit Copy Delete	16	161-15-7211	Arfan	Hosen		2	2021-04-26
Edit Copy Delete	17	163-15-8420	Md. Latiful	Kabir		2	2021-04-26
Edit Copy Delete	18	163-15-8448	Md. Rayhan	Anam		2	2021-04-26
Edit Copy Delete	19	163-15-8480	Md. Abu	Yousuf		2	2021-04-26
Edit Copy Delete	20	171-15-8558	Md. Shahriar	Shakil		2	2021-04-26
Edit Copy Delete	21	171-15-8725	Toufiq Hasan	Turza		2	2021-04-26
Edit Copy Delete	22	171-15-8769	Minhaj	Uddin		2	2021-04-26
Edit Copy Delete	23	171-15-8880	Rashedul	Islam		2	2021-04-26
Edit Copy Delete	24	171-15-9109	Tanbhir	Hasan		2	2021-04-26
Edit Copy Delete	25	171-15-9521	Md. Tofayel	Ahmed		2	2021-04-26
Edit Copy Delete	34	710001051	Sadekur	Rahman	sadekur-sir.jpg	2	2021-05-05

Fig-5.7: Member table implementation

Member table: This module allows user all information. Only that, admin allow to edit their profile and also change their password. Admin can delete the member record and add member photo.

5.8 Implementation of front end

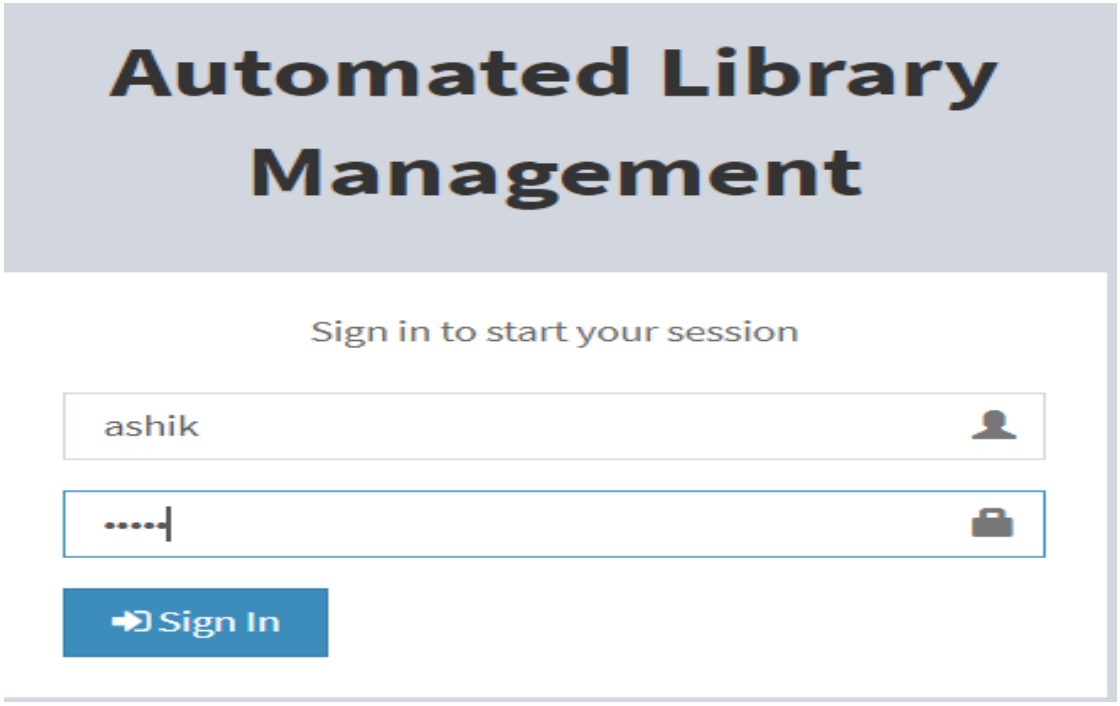


Fig-5.8: Admin login Implementation

Admin login: Admin login is the main part of the system. If the admin wants to login to the systems then he must be enter user id and password. If the admin forgets the password, he can recover the password. If the user id and password invalid it is not allowed the system.

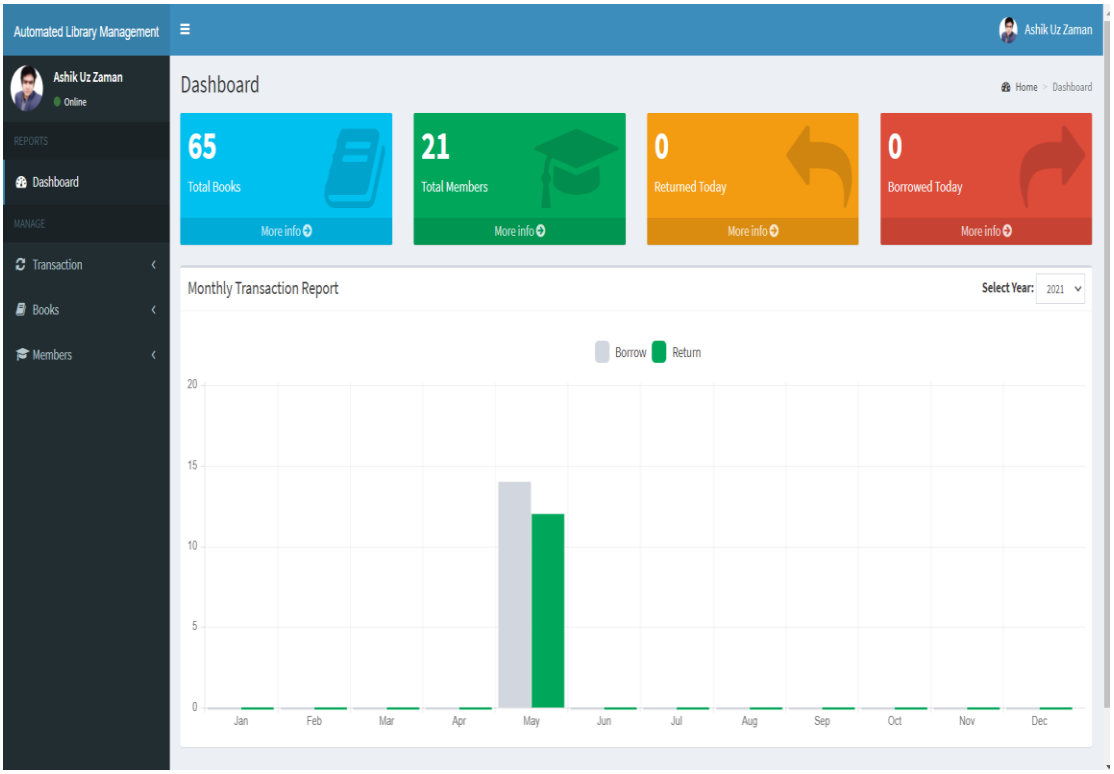


Fig-5.9: Dashboard implementation

Dashboard: This is home page my automated library management system project. My project front end design so simple not colorful design. My project at the top I have added four features total books, total members, borrowed books and return books. And will show a little downwards monthly transaction report. And monthly transaction report show every year.

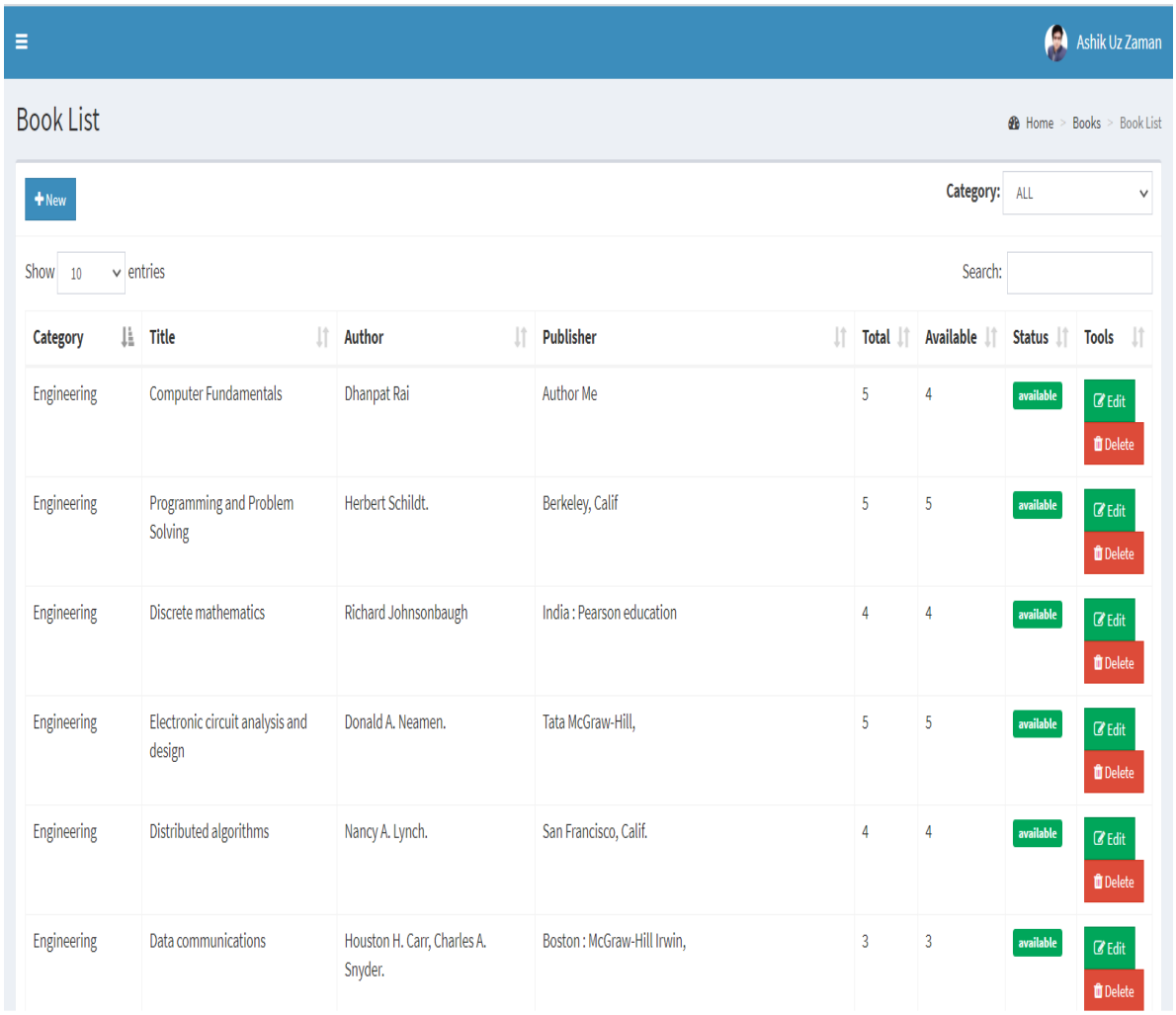


Fig-5.10: Book list implementation

Book list: The booklist is the place where the book is stored. Here all category books show in library when the book is added by book title ISBN number and author name. Only admin can maintenance whole the book list process. Admin can add new books and delete the books and also reserve the book. Book list show how many books copy per subject. And also show the book is available.

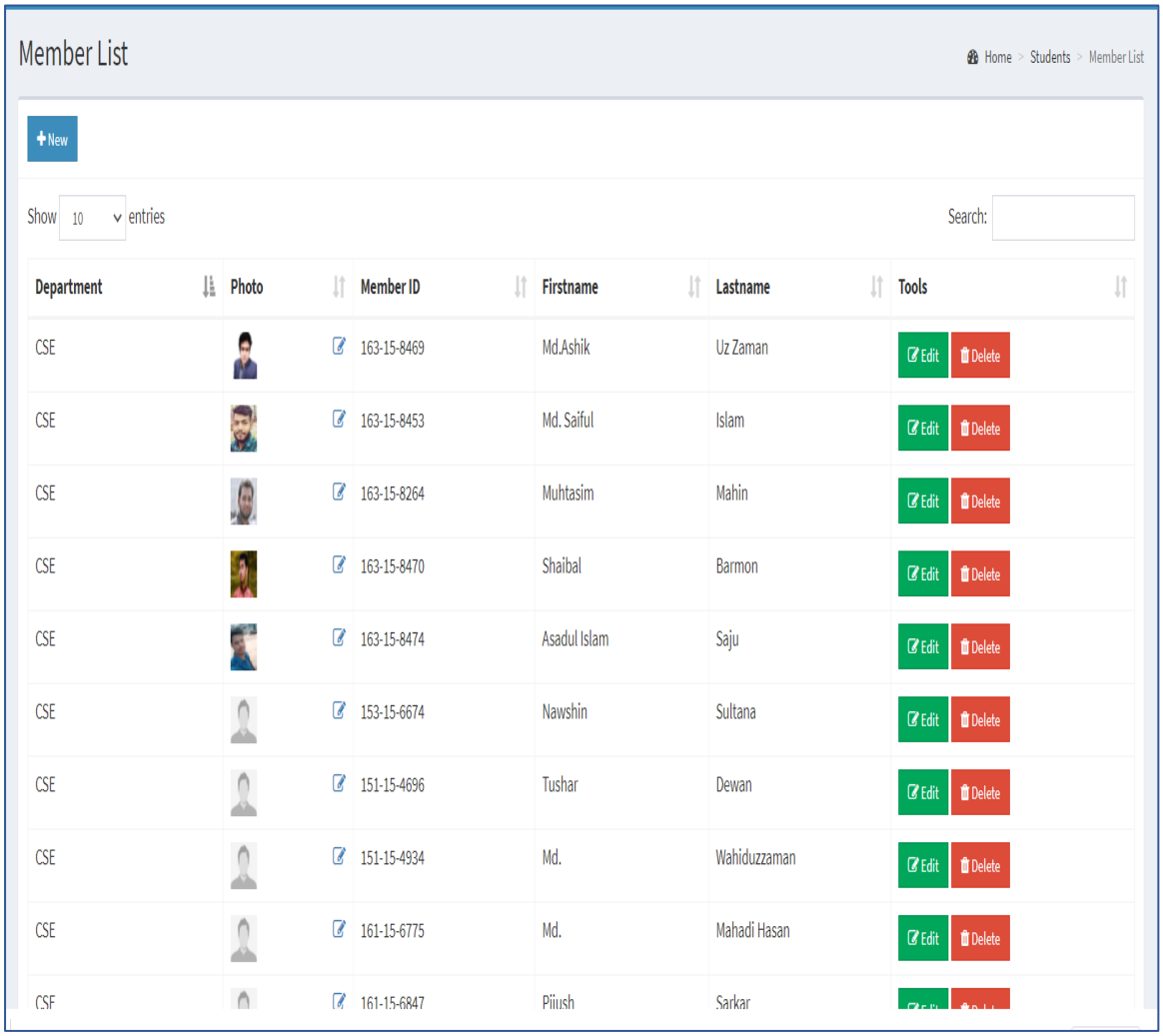


Fig-5.11: Member list implementation

Member list: Member list main part member information collection and record the system. Admin can add new members and delete members. Member maintenance admin such as add member Name, Academic ID card and Department.

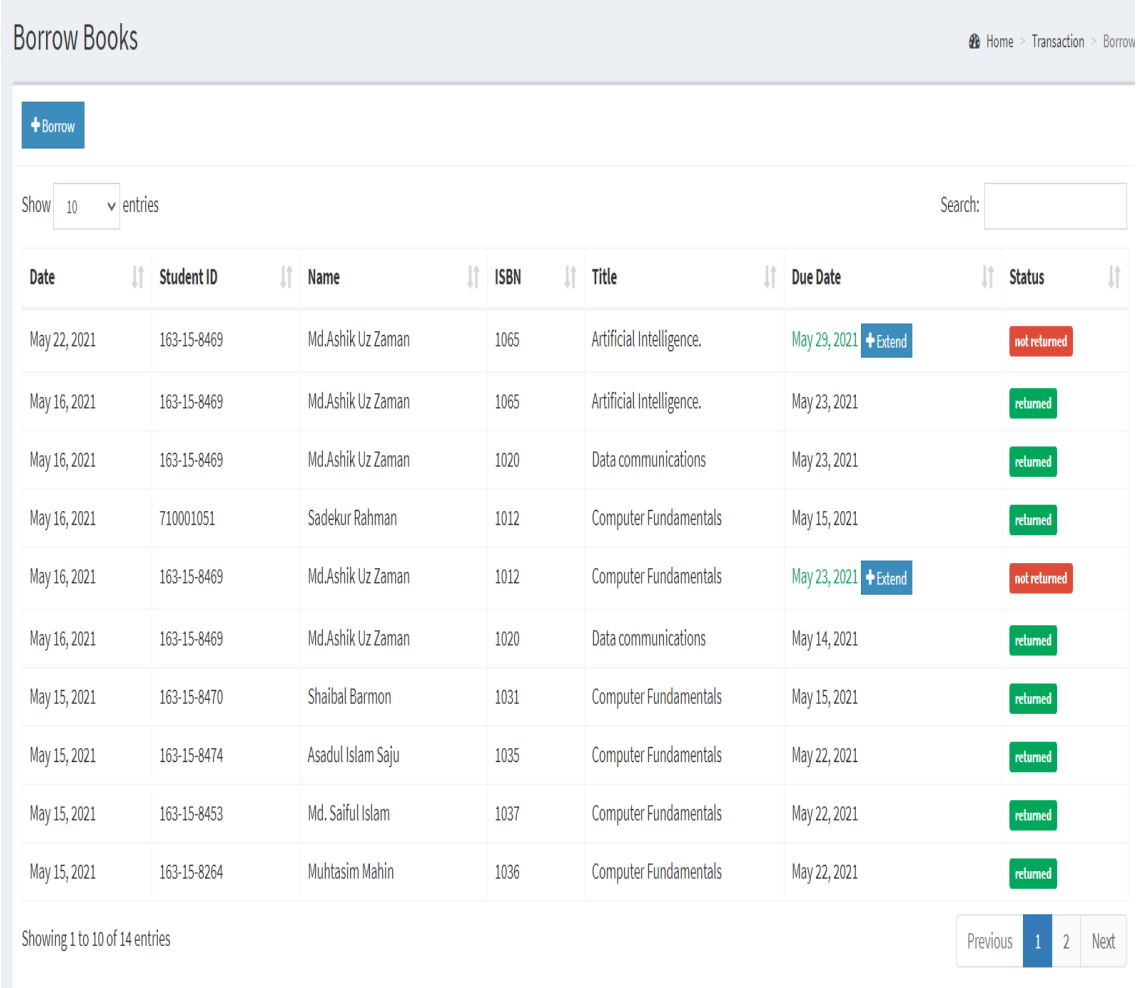


Fig-5.12: Borrow books implementation

Borrow books: When the user needs a book he will go to the library. Then he will search the book first if the book is available then he will bring the book to the librarian. The librarian will take the user academic ID card and entry the system. After that librarian will scan their book ISBN number and save the system. And also add the date in this system.

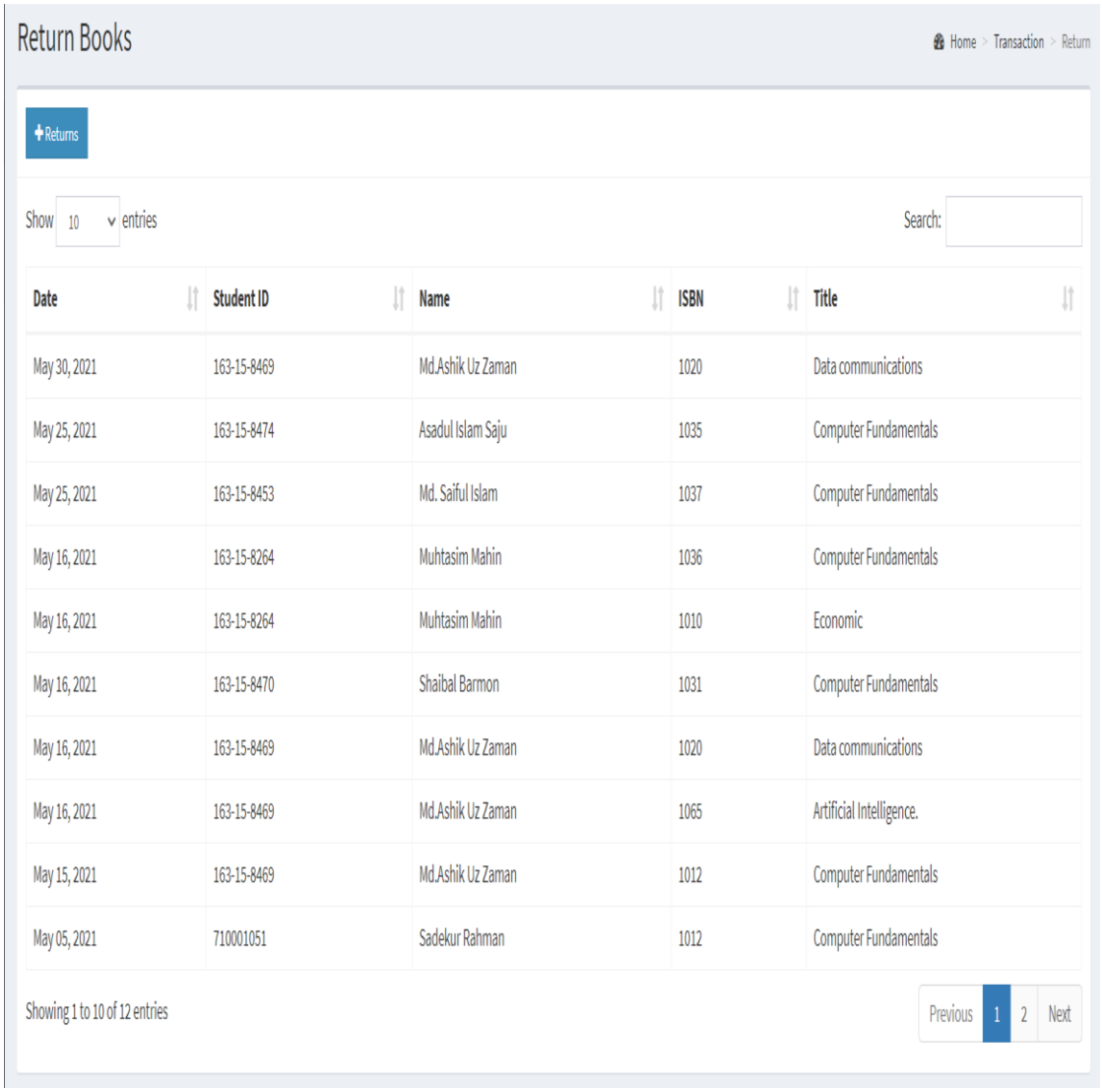


Fig-5.13: Return book implementation

Return books: When the user borrowed the book he must returned the book. And the user can see own transaction if he books borrowed. And also user can see return date of the borrowed book.

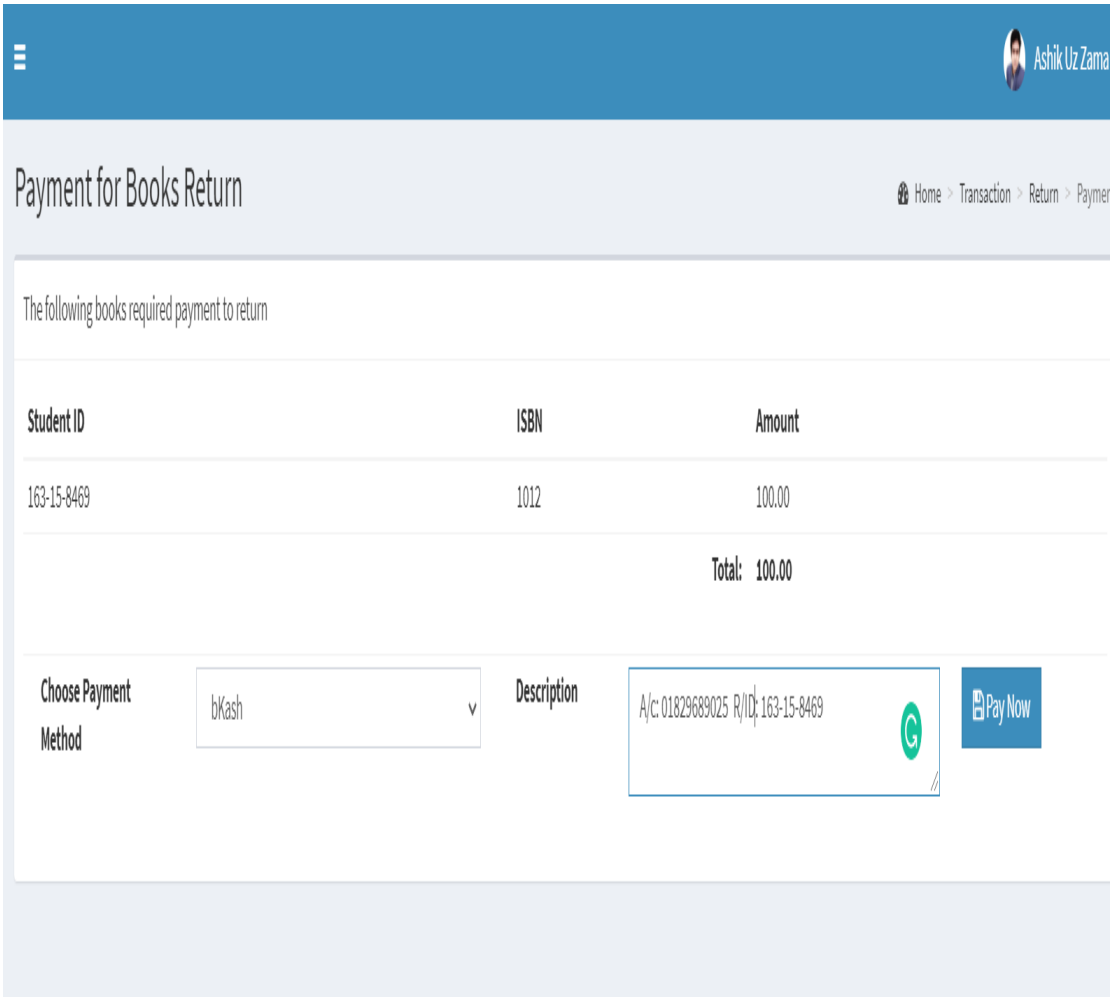


Fig-5.13: Payment methods implementation

Payment methods: Payment method is the most important part in this system. When a user borrows a book, he is given specific time if the user cannot return the book in that time he has to pay fifty taka per day. The amount of money will continue to increase fifty taka day by day. He will be able to pay this money through bikash, rocket and nogod.

CHAPTER 06

Conclusion and Future Scope

6.1 Conclusion

I believe that automated library management system will be very helpful for librarian and user. This system provides a computerized of library management system which benefit the users It makes entire process online where students can search books, borrow books and see the transaction. And Admin can easily maintain whole process. There are no mistakes of chances.

So I want developed my application in demand of tomorrow's world.

6.2 Future scope

My automated library management system I want more features add such as online lectures video tutorials students can discuss various issues. Student can registration easily. Student get pdf book are available and download the books. Student can discuss about the department books. Student can extend the book time. Book reservation.

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APPENDICES

Appendix A: Project Reflection

The purpose we creating this project are to let common library have an automated library management system. A lot small size library was using paper-based management system. But followed by the increase of visitors and member, librarian was suffered because there are a lot of records. When need to search for particular member record, the librarian need a lot of time. IN addition, they are suffered from a lot paper-based problem such as loss of member's record. Some record was missing because they failed to take good care of it. For example, the librarians forget to put back the record into cupboard when they are busy. Since my last visit to that library, I found that they need a computer management system so I think of this idea to developing a system for small size library. This is to avoid some paper-based problem such as loss of record and etc.

With the library system, librarians are able to record all the new books and new transactions. We implement the use of ISBN number in this project so that librarian can process the book transaction faster when a lot of members want to make a transaction. They can save a lot of time without writing the book id.

I try to add in more detail information my Automated Library Management Project.

Automated Library Management

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