



Mini Project

CSE464 LAB

Advanced Database Systems

Fall 2022, Sec 01

Title: OpenLib.

GitHub: [GitHub - faisalaazhar/OpenLib at master](https://github.com/faisalaazhar/OpenLib)

Submitted By

Md. Faisal Ahmed Ridoy

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Submitted To

Md. Mohsin Uddin

Senior Lecturer

Department of Computer Science & Engineering

East West University

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1. Introduction

OpenLib is an online library management system where users can borrow books.

Many people don't want to buy books because of their high cost. But they really want to read books. So, our online library will provide books to a customer with a little number of charges.

Customer will pay a percentage of book price and keep them maximum 3 weeks, after that they will be charged fines. The people who love to read books will have a great opportunity.

2. System Features and Requirements:

2.1 Non-Functional Requirements

Safety of Database

This requirement ensures the safety of the data of the system. There may be possibilities of damage in a certain proportion in the database or the disk can be crashed. In this situation the backup system will provide the safety of system data.

Security Assurance of Users

The data of the users should be safe at all costs. Everyone's privacy needs to be prioritized. In that case the security system will manage data of the user strictly.

Others Quality

- Efficiency requirements: where all execution will process fast.
- Usability requirements: where usability of system will be friendly.
- Ethical requirements: where data will be secured from developers.
- Environment requirements: where the system can be runnable in most of the operating system.
- Performance requirements: where all the functions of the system will work properly without any hassle.
- Space requirements: where the system will consume less storage.

2.2 Functional Requirements

User:

1. Users can create accounts.
2. Users can borrow books.
3. Users can create, update and delete a blog post.

4. Users can search for posts.
5. View available books in stock.
6. View borrows history in his/her profile.

System:

1. The system will not allow users to borrow a book on Friday.
2. A maximum of 2 books are allowed to borrow per week.
3. The system will charge fines if the user returns a book after 3 weeks.

Admin:

1. Admin can add books in databse.
2. Admin can remove a user, book and post.

3. Technologies

- Programming languages — Python
- Application Framework — Django
- Database — Oracle, MongoDB
- Structure Web Page language — HTML
- Web Page Design language — CSS
- Others framework — Bootstrap framework for CSS and JS
- Data storage — SDD
- Application server — Localhost:8000

4. Database Connections:

Oracle as default database for the table user, books, borrow book and book transaction:

```
82 # Database
83 # https://docs.djangoproject.com/en/4.1/ref/settings/#databases
84
85 DATABASES = {
86     'default': {
87         'ENGINE': 'django.db.backends.oracle',
88         'NAME': 'orcl',
89         'USER': 'openlib',
90         'PASSWORD': 'openlib',
91         'HOST': 'localhost',
92         'PORT': '1521',
93     }
94 }
```

MongoDB is used to manage blogs:

```
5 | import pymongo
6
7
8 | # MongoDB Connect
9 | db_client = pymongo.MongoClient("mongodb://localhost:27017")
10 | db = db_client["django-library"]
11 | blog_table = db["blog-post"]
12
13
```

Table-01: Database Connections

5. Database Models:

User	Blog	Books	Borrow Book	Book Transaction
<u>id</u>	<u>id</u>	<u>id</u>	<u>id</u>	<u>id</u>
username	title	publisher	Book_id(fk)	Borrow_id(fk)
Full name	content	author	User_id(fk)	Borrow_cost
First name	user	cover_photo	Date_borrowed	fine
Last name	publishedAt	category	Date_returned	Total_amount
password	updatedAt	num_of_page		
email		num_of_copies		
Is_super		price		
Other fields of django auth user		description		

Table-02: Database Schema

6. PL/SQL Functions, Procedures and Triggers:

Functions		
Name	Description	Code
calc_borrow_cost	Calculate the borrowing cost of a book. Borrow cost is the percentage of actual cost of book. If the cost is greater than 500 TK then the borrowing cost will be 20% else 10%.	create or replace FUNCTION calc_borrow_cost(cost NUMBER) RETURN NUMBER IS borrow_cost NUMBER; BEGIN IF cost > 500 THEN borrow_cost := cost*0.2; RETURN borrow_cost; ELSIF cost < 500 THEN borrow_cost := cost*0.1; RETURN borrow_cost; END IF; END;

is_friday	This function checks if the current day is Friday or not. System will not allow to borrow books on Friday.	create or replace FUNCTION is_friday RETURN BOOLEAN IS day_c VARCHAR2(20); BEGIN day_c := TO_CHAR(SYSDATE, 'DAY'); IF day_c = 'FRIDAY' THEN RETURN TRUE; ELSE RETURN FALSE; END IF; END;
stock_count	Return the count of stock of a particular book from book table.	create or replace FUNCTION stock_count(b_id number) return number IS stk_count NUMBER; BEGIN SELECT num_of_copies INTO stk_count FROM book where book_id=b_id; return stk_count; END;

Procedures

Name	Description	Code
insert_book_trans action	This procedure is called when user borrow a book. This procedure insert 2 rows in borrow book and book transaction table.	create or replace PROCEDURE insert_book_transaction(u_id NUMBER, b_id NUMBER) IS borrow_cost NUMBER; price_of_book NUMBER; borrow_id NUMBER := seq_book.NEXTVAL; BEGIN SELECT price into price_of_book from book where book_id=b_id; borrow_cost := calc_borrow_cost(price_of_book); insert into borrow_book (borrow_id, user_id, book_id, date_borrowed) values (borrow_id, u_id, b_id, sysdate); insert into book_transaction (book_transaction_id, borrow_id, borrow_cost, total_cost) values (book_tr_num.NEXTVAL, borrow_id, borrow_cost, borrow_cost);

		END;
return_book	This procedure is called when a user returns a book. This procedure update both borrow book and book transaction table. Fines, total cost is calced also.	<pre> create or replace PROCEDURE return_book(b_id NUMBER) IS bor_cost NUMBER; calc_fines NUMBER; total_amount NUMBER; diff NUMBER; BEGIN UPDATE borrow_book SET date_returned = sysdate WHERE borrow_id = b_id; select trunc(date_returned - date_borrowed) into diff from borrow_book where borrow_id=b_id; select borrow_cost into bor_cost from book_transaction where borrow_id=b_id; if diff > 21 then calc_fines := (diff-21)*5; else calc_fines := 0; end if; total_amount := bor_cost+calc_fines; UPDATE book_transaction SET fines = calc_fines, total_cost = total_amount WHERE borrow_id = b_id; END;</pre>

Triggers

Name	Description	Code
dec_book_copies	This trigger is activated after inserting on table borrow book. When a user borrows a book, the stock count of that book will decrease by 1.	<pre> create or replace TRIGGER dec_book_copies AFTER INSERT ON borrow_book FOR EACH ROW BEGIN UPDATE book SET num_of_copies = (num_of_copies-1) WHERE book_id = :new.book_id; END;</pre>
inc_book_copies	This trigger is activated after updating on table	<pre> create or replace TRIGGER inc_book_copies AFTER UPDATE ON borrow_book</pre>

	borrow book. When a user returns a book, the stock count of that book will increase by 1.	<pre> FOR EACH ROW BEGIN UPDATE book SET num_of_copies = (num_of_copies+1) WHERE book_id = :new.book_id; END;</pre>
--	---	---

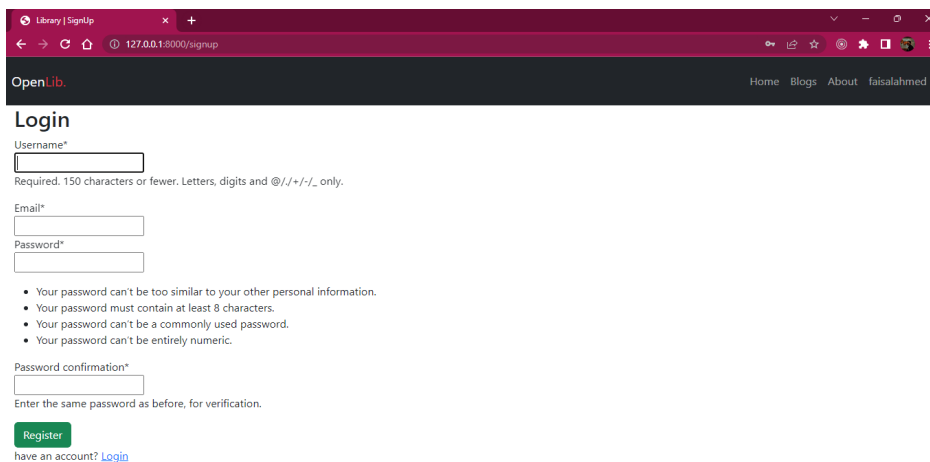
Table-03: PL/SQL Functions, Procedures and Triggers

7. GUI Screenshots:

Login Page:



Create account page:



Home page with all books:

OpenLib.


HomeBlogsAboutfaisalahmed

Welcome to Online Library

"Good friends, good books, and a sleepy conscience:
this is the ideal life."
— Mark Twain


Add Book

Popular Books



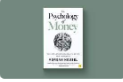
Name: Eucalyptus
Author: Dan Brown
Price: 200.000 TK.
Bio: Amazing Book with a lot of stories
Total Pages: 120
In Stock: 21

Borrow NowDelete




Name: Naruto
Author: Masashi Kishimoto
Price: 1000.000 TK.
Bio: Amazing Book with a lot of stories
Total Pages: 520
In Stock: 120

Borrow NowDelete



Name: The Lost Symbol
Author: Dan Brown
Price: 800.000 TK.
Bio: Amazing Book and you will vanish into the story
Total Pages: 485
In Stock: 12

Borrow NowDelete



Name: Sherlock Holmes
Author: Sherlok Holmes
Price: 250.000 TK.
Bio: There are multiple main character plays role in multi dimension.
Total Pages: 200
In Stock: 10

Borrow NowDelete

Add a book into database:

Library | Add Book

127.0.0.1:8000/addBook

OpenLib. Home Blogs About faisalahm

Book Details

Choose File No file chosen

Upload Photo

Book id: 1000

Title: Eucalyptus

Publisher: Symbolic

Author: Dan Brown

Category: Thriller, Action, Puzzle

Num of copies: 20

Num of pages: 120

Price: 200

Book description: Amazing Book with a lot of stories

Cover photo: /media/book3.jfif


Add Book

The stock count of Naruto book is 120:

Library | Home

127.0.0.1:8000/home

Popular Books



Name: Eucalyptus
Author: Dan Brown


Price: 200.000 TK.

Bio: Amazing Book with a lot of stories

Total Pages: 120

In Stock: 21

[Borrow Now](#) [Delete](#)



Name: Naruto
Author: Masashi Kishimoto


Price: 1000.000 TK.

Bio: Amazing Book with a lot of stories

Total Pages: 520

In Stock: 120

[Borrow Now](#) [Delete](#)



Name: The Lost Symbol
Author: Dan Brown


Price: 800.000 TK.

Bio: Amazing Book and you will vanish into the story

Total Pages: 485

In Stock: 11

[Borrow Now](#) [Delete](#)



Name: Sherlock Holmes
Author: Sherlock Holmes

Price: 250.000 TK.

Bio: There are multiple main character plays role in multi dimension.

This is a profile page with book-borrowing history. After borrowing 2 books, the count decreases from 120 to 118 of Naruto book:







Library | Profile x +

127.0.0.1:8000/profile

OpenLib. Home Blogs About faisalahmed


Hi, Faisal

Your Book Borrowing History

	Book ID	Title	Price	Borrow Cost	Fines	Date Borrowed	Date Returned	Total Cost
	1002, 1055	The Lost Symbol	800.000 TK	160.000 TK	None	Jan. 4, 2023, 1:33 a.m.	Return Book	160.000 TK
	1001, 1066	Naruto	1000.000 TK	200.000 TK	None	Jan. 4, 2023, 1:33 a.m.	Return Book	200.000 TK
	1001, 1077	Naruto	1000.000 TK	200.000 TK	None	Jan. 4, 2023, 1:36 a.m.	Return Book	200.000 TK
	1000, 1000	Eucalyptus	200.000 TK	10.000 TK	0.000	Jan. 3, 2023, 10:13 a.m.	Jan. 3, 2023, 12:42 p.m.	10.000 TK
	1000, 1011	Eucalyptus	200.000 TK	20.000 TK	0.000	Jan. 3, 2023, 10:36 a.m.	Jan. 3, 2023, 1:53 p.m.	20.000 TK
	1001, 1022	Naruto	1000.000 TK	200.000 TK	0.000	Jan. 3, 2023, 11:01 a.m.	Jan. 3, 2023, 12:45 p.m.	200.000 TK

Count decreased of book Naruto:

Popular Books



Name: Eucalyptus
Author: Dan Brown


Price: 200.000 TK.

Bio: Amazing Book with a lot of stories

Total Pages: 120

In Stock: 21

[Borrow Now](#) [Delete](#)



Name: Naruto
Author: Masashi Kishimoto

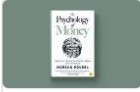
Price: 1000.000 TK.

Bio: Amazing Book with a lot of stories

Total Pages: 520

In Stock: 118

[Borrow Now](#) [Delete](#)



Name: The Lost Symbol
Author: Dan Brown


Price: 800.000 TK

Bio: Amazing Book and you will vanish into the story

Total Pages: 485

In Stock: 11

[Borrow Now](#) [Delete](#)



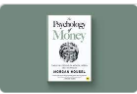



Name: Sherlock Holmes
Author: Sherlock Holmes

After returning a book the fines, date returned, and total cost is updated also:

	1002, 1055	The Lost Symbol	800.000 TK	160.000 TK	None	Jan. 4, 2023, 1:33 a.m.	Return Book	160.000 TK
	1001, 1066	Naruto	1000.000 TK	200.000 TK	None	Jan. 4, 2023, 1:33 a.m.	Return Book	200.000 TK
	1001, 1077	Naruto	1000.000 TK	200.000 TK	0.000	Jan. 4, 2023, 1:36 a.m.	Jan. 4, 2023, 1:39 a.m.	200.000 TK
	1000, 1000	Eucalyptus	200.000 TK	10.000 TK	0.000	Jan. 3, 2023, 10:13 a.m.	Jan. 3, 2023, 12:42 p.m.	10.000 TK

After returning Naruto book the count increased from 118 to 119:

 <p>Name: Eucalyptus Author: Dan Brown Price: 200.000 TK. Bio: Amazing Book with a lot of stories Total Pages: 120 In Stock: 21 Borrow Now Delete</p>	 <p>Name: Naruto Author: Masashi Kishimoto Price: 1000.000 TK. Bio: Amazing Book with a lot of stories Total Pages: 520 In Stock: 119 Borrow Now Delete</p>	 <p>Name: The Lost Symbol Author: Dan Brown Price: 800.000 TK. Bio: Amazing Book and you will vanish into the story Total Pages: 485 In Stock: 11 Borrow Now Delete</p>
 <p>Name: Sherlock Holmes</p>		

Blog page contains all blogs:

OpenLib

Home Blogs About faisalahmed

Search Blogs


Search

What's on your mind?
Your word inspire people.
Make the day a beautiful one.


Post Your Blog

LIBRARY


Popular Blogs




by faisalahmed
Chainsawman
Amazing anime in trend now. Denji who turned into a devil and working with devil hunters now.
[Edit](#) [Delete](#)



by faisalahmed
Denji in Red
This is a anime poster of character Denji from Chainsawman. Amazing anime in trend now.
[Edit](#) [Delete](#)



by faisalahmed
Naruto Uzumaki
This is one of the best anime in Japanese shonen jump. This are popular among teenagers.
[Edit](#) [Delete](#)



by faisalahmed
Black Clover
This is Asta from Black Clover anime. He is from hage village and under black bulls clan.
[Edit](#) [Delete](#)

Users create or update a post:

Library | Create Blog

127.0.0.1:8000/blog/addBlog

OpenLib.

Home Blogs About faisalahmed

Create Your Blog


Write Your Thoughts

Choose File

No file chosen

Post

Before update:



by faisalahmed

Denji in Red

This is a anime poster of character Denji from Chainsawman.

Edit

Delete

Update blog form:

Library | Update Blog

127.0.0.1:8000/blog/updateBlog/63b48782d966830a818f47cf

OpenLib.


Update Your Blog

Denji in Red

This is a anime poster of character Denji from Chainsawman.
Amazing anime in trend now.

Update

After update:




by faisalahmed

Chainsawman

Amazing anime in trend now. Denji who turned into a devil and working with devil hunters now.

EditDelete



by faisalahmed

Denji in Red

This is a anime poster of character Denji from Chainsawman. Amazing anime in trend now.

EditDelete


Search blog page:

Library | Blogs

127.0.0.1:8000/blog/search

Home Blogs About faisalahmed Search Blogs Search

Search results for 'Chainsawman'



by faisalahmed

Chainsawman

Amazing anime in trend now. Denji who turned into a devil and working with devil hunters now.

EditDelete