

Database Systems Project Report:

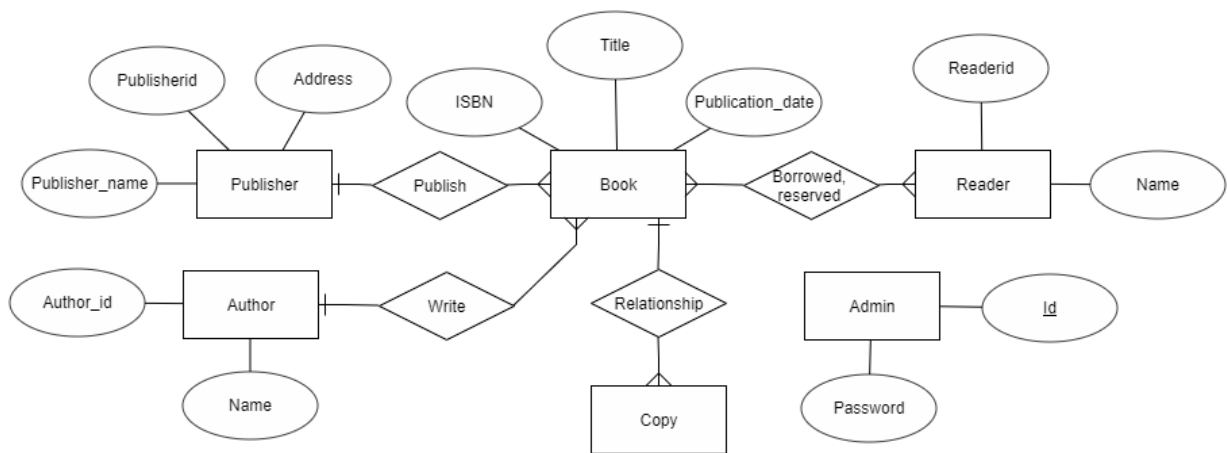
JingYun Wang - 1201338

Jie Chong - 1173649

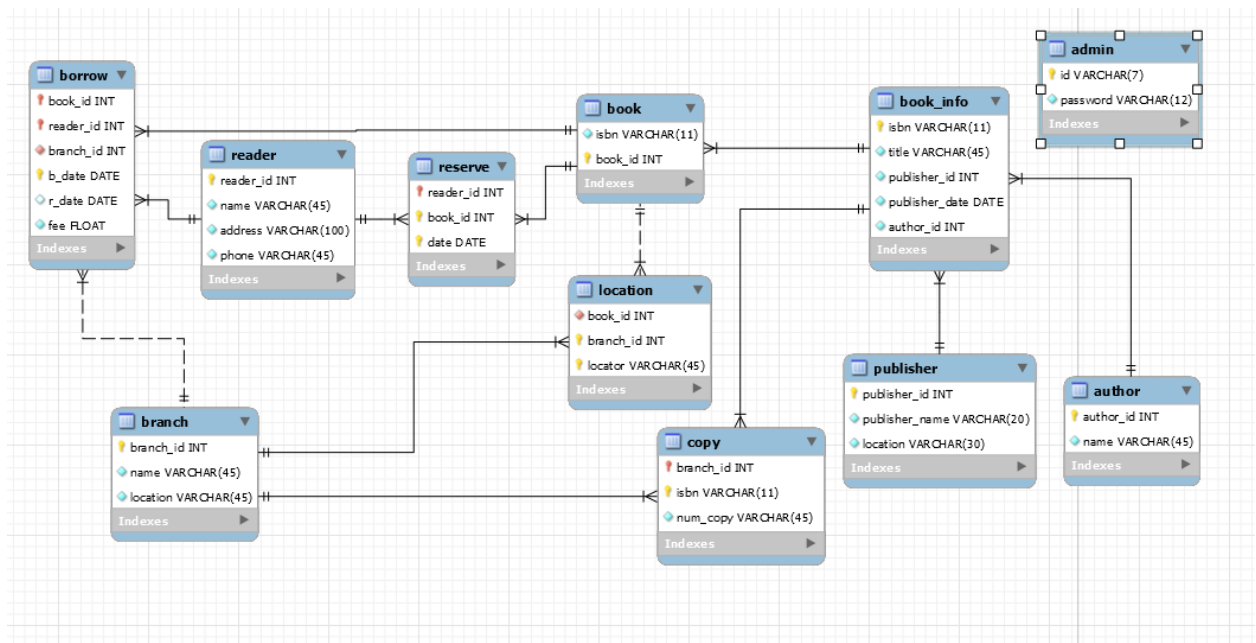
For the final Database Systems project, we used Java(Eclipse) to create the GUI and compute the database related operations. And we used MySql and ERplus to create tables and ER diagrams. To introduce our projects, we are planning to our library system “LibraryMe” into two sections which includes database introduction and the demonstration of our database system.

I. Database Introduction:

1. ER Diagram



2. Data Model



In our data model, we have 11 tables which include: admin, reader, borrow, reserve, publisher, location, copy, author, branch, book and book_info.

- 1) **admin:** this table is only for store password and user id of administrator login. And it does not have relation to other tables.

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
id	VARCHAR(7)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
password	VARCHAR(12)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- 2) **book:** book table is conjunction table which hold isbn and id of each book. The primary key of this table is book_id and isbn is referring to the isbn in book_info table. When every time adding a new book into the table, it will generate a new book_id incrementally.

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
isbn	VARCHAR(11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
book_id	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- 3) **book_info:** book_info table contains data such as isbn(Primary Key), title, publisher_id(its referring the publisher_id in publisher table), publisher_date and author_id(its referring to the author_id in author table).

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
isbn	VARCHAR(11)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
title	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
publisher_id	INT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
publisher_date	DATE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
author_id	INT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- 4) **author:** this table contains data of author_id(primary key) and name of the author. A new author_id will be automatically generated when a new author is adding to the table.

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
author_id	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
name	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- 5) **publisher:** this table contains data of publisher_id(primary key), name of the publisher and location. A new publisher_id will be automatically generated when a new author is adding to

the table.

[illegible]

- 6) **copy:** this table contains data of branch_id, isbn and num_copy(number of copies). The branch_id is referring to the branch_id in branch table and isbn is referring to the isbn in book_info table. branch_id and isbn are a composite primary key.

[illegible]

- 7) **branch:** this table contains the data of branch_id(primary key), name of the branch and location.

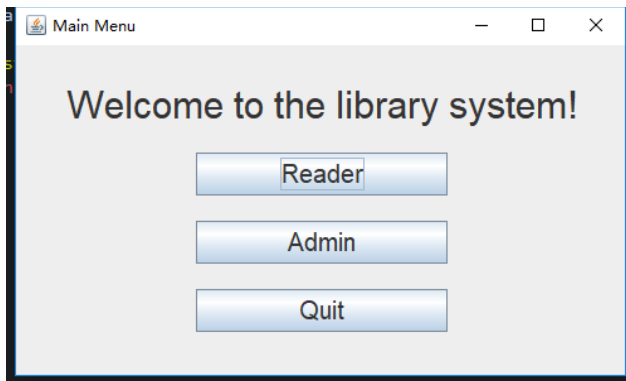
[illegible]

- 8) **location:** this table contains data of book_id, branch_id and the location of the book. book_id is referring to the book_id in book table and branch_id is referring to the branch_id in branch. Branch_id and locator are a composite primary key.

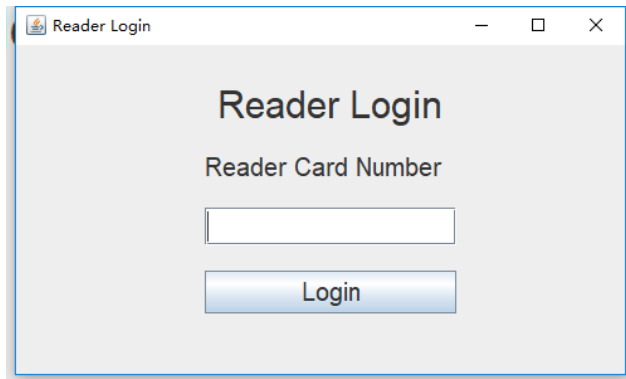
[illegible]

II. Program

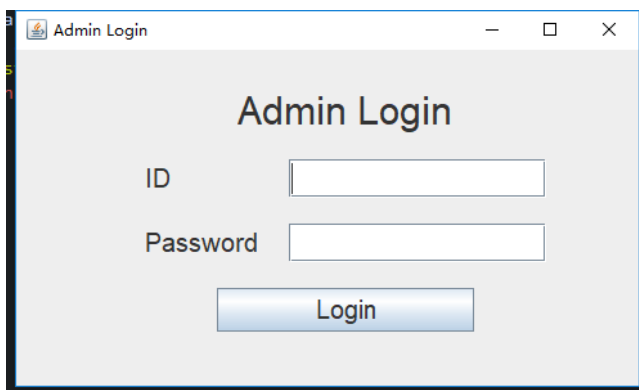
1. Main Menu



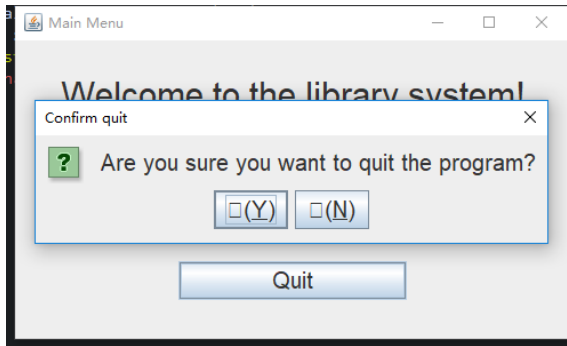
If click on Reader button, the program goes to the reader login page and user need to input the card number to login.



If click on Admin button, the program goes to the admin login page and user need to input the admin username and password to login.



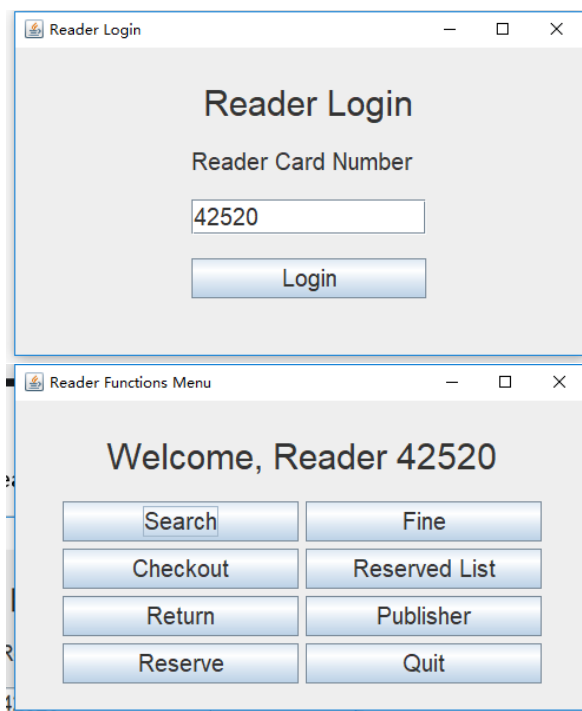
If click on Quit button, the program will ask user to confirm to qui the program



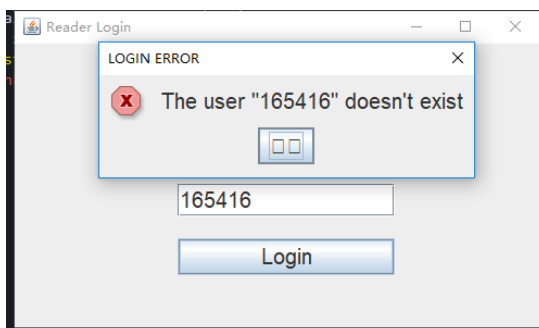
2. Reader Menu

1) Login

Input the right reader card number to login

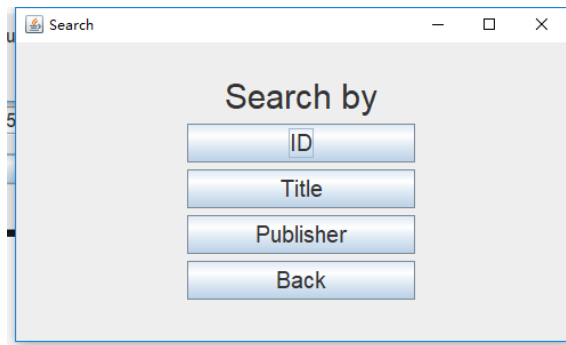


If the card number is wrong, user will see a message

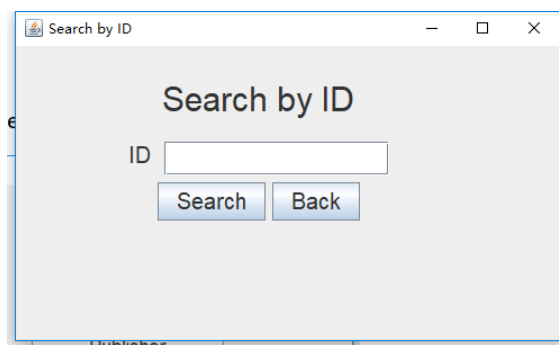


2) Search

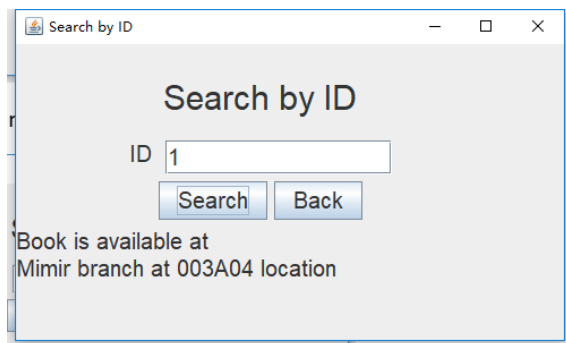
On reader menu, when click on search button, user can do search by different attributes



When click on ID button, user can search book by book id

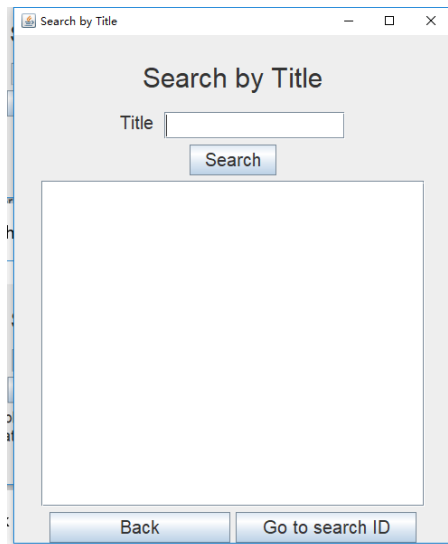


Input the right book id and click on search button to check the book status

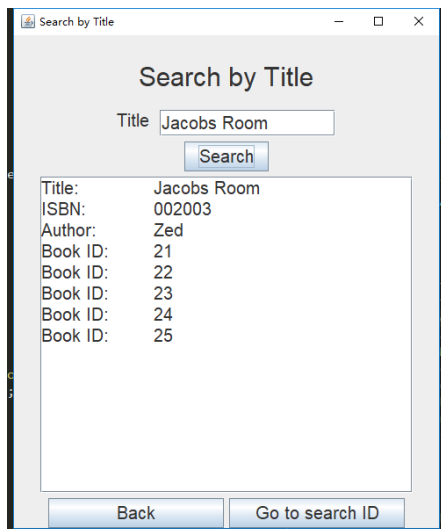


Click on back button to go back to search by page

When click on Title button, user can search the book title



Input the book title and click the search to do search



Input a part of the title is the same effect

Click on the Go to button to go the search ID page

Click on the Back button to go back to the search by page

Click on the Publisher butto to search by publisher

Choose a publisher name and click the search button

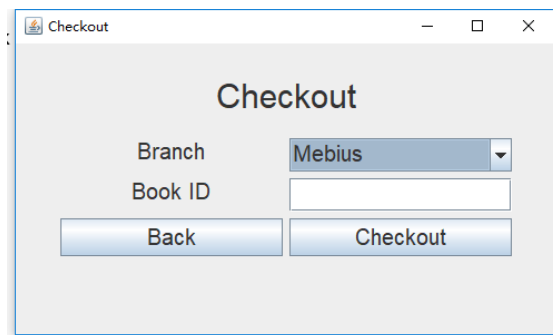


Click on Go to button to go to search title

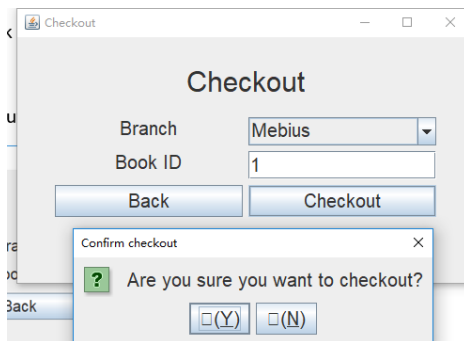
Click on back button to go back to the search by page

3) Checkout

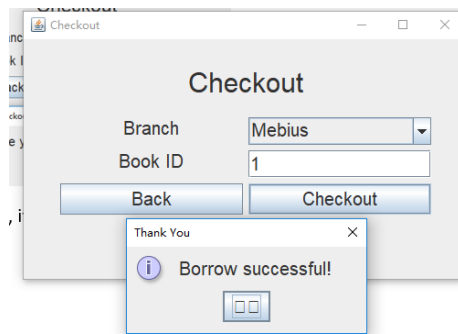
Click checkout button to checkout borrowing



Choose a branch name and input the book ID, then click on the checkout button, user is asked to confirm the checkout



Click on yes, if the borrowing is successful, user will see a message



Let's see the database

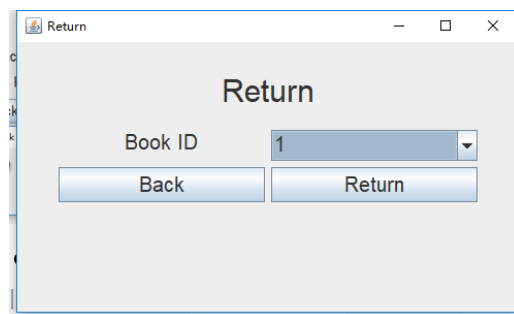
Result Grid | Filter Rows: | Edit:

	book_id	reader_id	branch_id	b_date	r_date	f
	1	42520	1	2018-05-03	NULL	0
	2	52026	7	2013-12-21	2013-12-31	0
	4	89814	10	2013-04-30	NULL	0

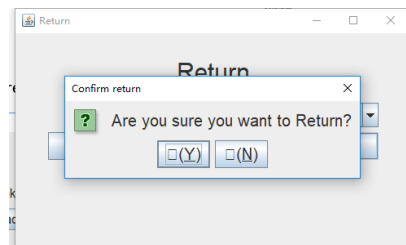
borrow table

4) Return

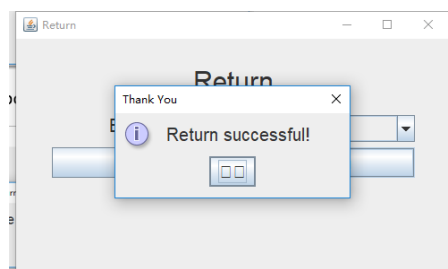
Click on the return button to return a book



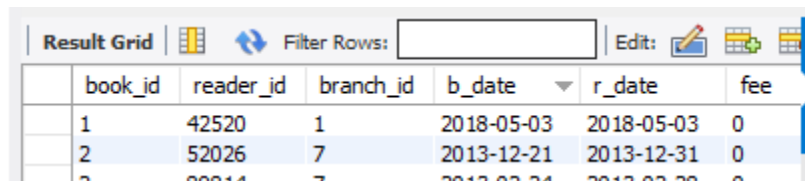
Choose the book ID you want to return and click on the return button



Click yes



User will see a message if return succeeded, let's see the database



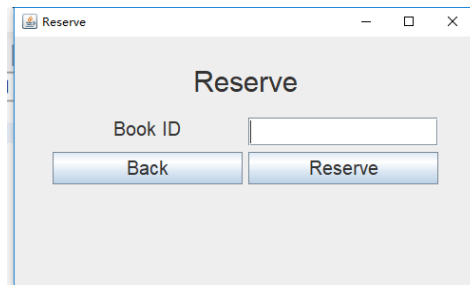
A screenshot of a database application's 'Result Grid' window. It displays a table with columns: book_id, reader_id, branch_id, b_date, r_date, and fee. The first two rows are highlighted in blue. The first row has values: 1, 42520, 1, 2018-05-03, 2018-05-03, 0. The second row has values: 2, 52026, 7, 2013-12-21, 2013-12-31, 0.

	book_id	reader_id	branch_id	b_date	r_date	fee
1	1	42520	1	2018-05-03	2018-05-03	0
2	2	52026	7	2013-12-21	2013-12-31	0

borrow table

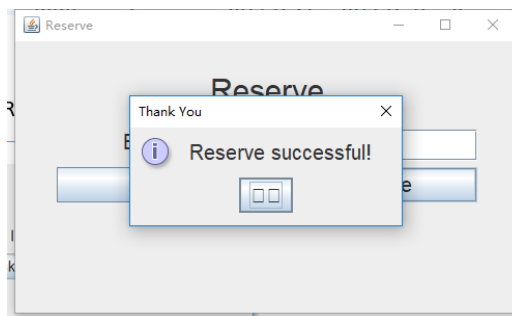
5) Reserve

Click on the Reserve button to reserve a book



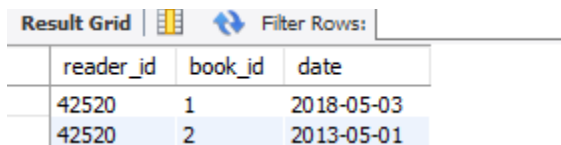
A screenshot of a 'Reserve' dialog box. It has a title bar with 'Reserve' and standard window controls. Inside, there's a label 'Book ID' next to a text input field. Below the input field are two buttons: 'Back' and 'Reserve'.

Input the book id you want to reserve and click on the reserve button



A screenshot of the 'Reserve' dialog box with a modal message box on top. The message box has a title 'Thank You' and contains the text 'Reserve successful!' with an information icon. The 'Reserve' dialog box is partially visible in the background.

Database:



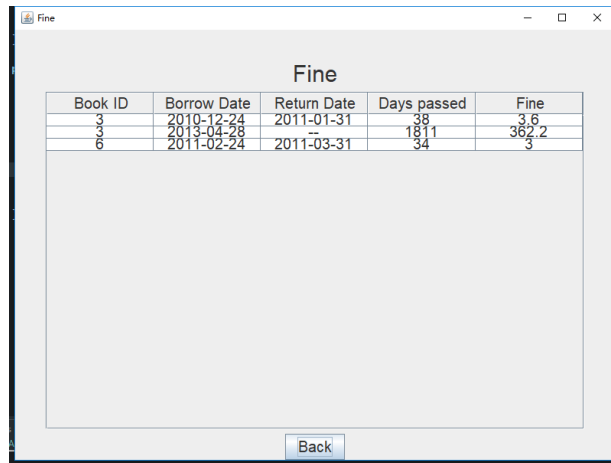
A screenshot of a database application's 'Result Grid' window. It displays a table with columns: reader_id, book_id, and date. The first two rows are highlighted in blue. The first row has values: 42520, 1, 2018-05-03. The second row has values: 42520, 2, 2013-05-01.

	reader_id	book_id	date
1	42520	1	2018-05-03
2	42520	2	2013-05-01

reserve table

6) Fine

Click on the fine button to see all the borrowing on you and fine of each borrowing

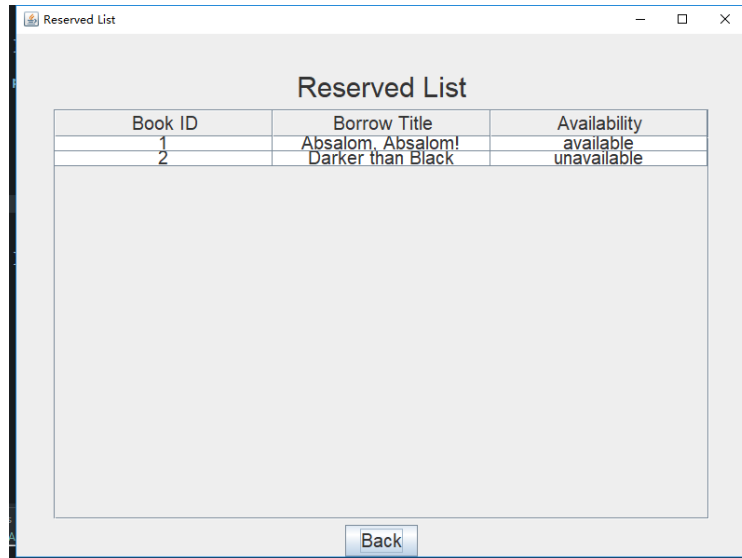


The screenshot shows a window titled "Fine" with a table containing borrowing records. The table has five columns: Book ID, Borrow Date, Return Date, Days passed, and Fine. Below the table is a large empty rectangular area and a "Back" button at the bottom.

Book ID	Borrow Date	Return Date	Days passed	Fine
3	2010-12-24	2011-01-31	38	3.6
3	2013-04-28	-	1811	362.2
6	2011-02-24	2011-03-31	34	3

7) Reserve List

Click on the Reserve List button to see all the reservations and their availabilities

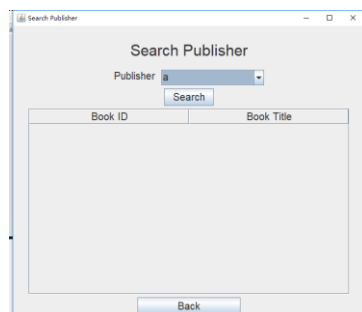


The screenshot shows a window titled "Reserved List" with a table containing reservation records. The table has three columns: Book ID, Borrow Title, and Availability. Below the table is a large empty rectangular area and a "Back" button at the bottom.

Book ID	Borrow Title	Availability
1	Absalom, Absalom!	available
2	Darker than Black	unavailable

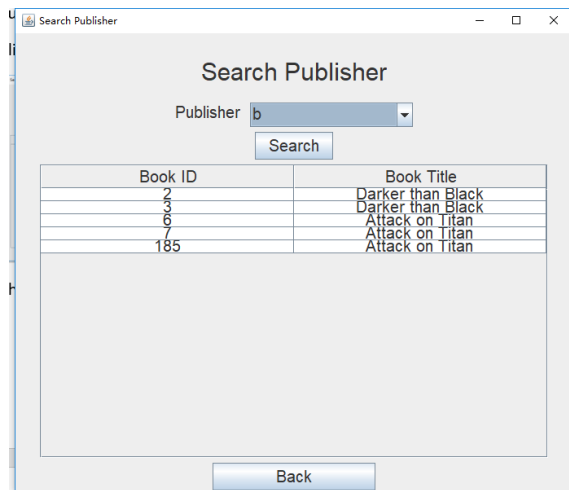
8) Publisher

Click on the publisher button to see all book copies published by a publisher



The screenshot shows a window titled "Search Publisher" with a search interface. It includes a "Publisher" dropdown menu, a "Search" button, and a table with columns "Book ID" and "Book Title". Below the table is a large empty rectangular area and a "Back" button at the bottom.

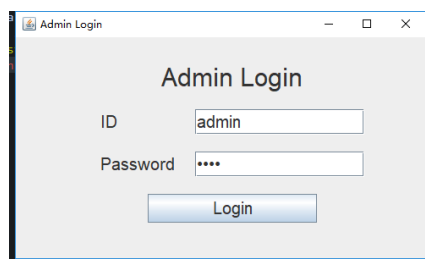
Choose a publisher and click the search button



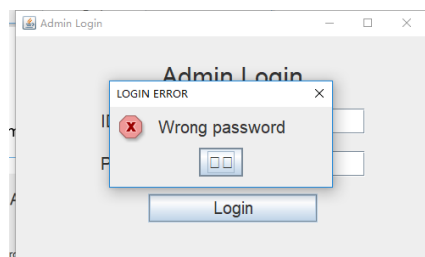
3. Admin Menu

1) Login

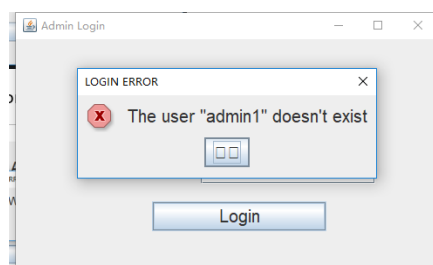
Input the admin ID and password to login



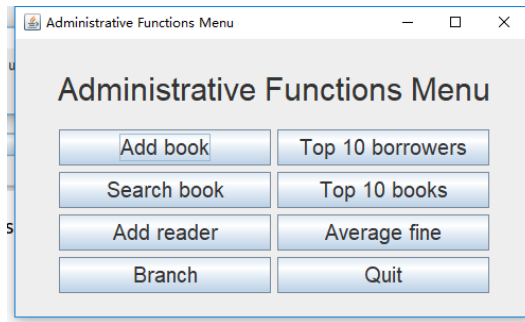
If the password is wrong



If the user is not existing

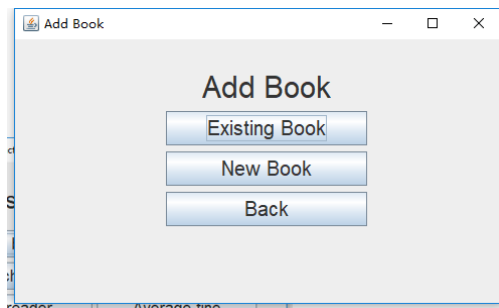


Login successful to see the admin menu

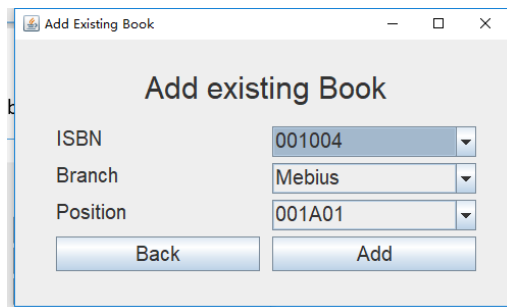


2) Add book

Click on add book button to add a book

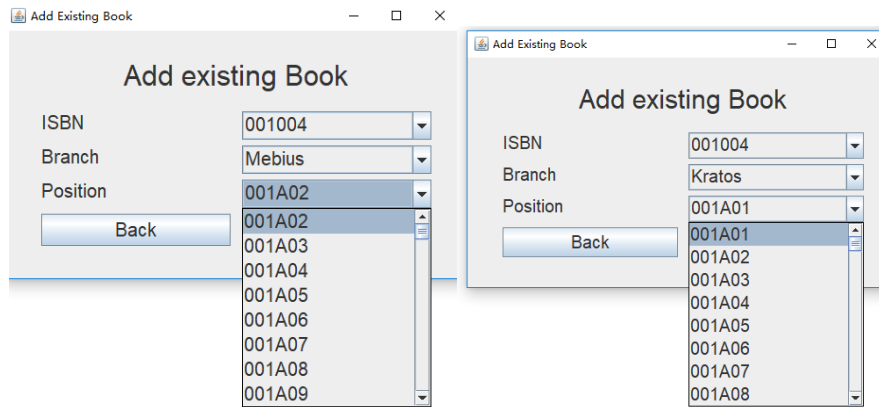


Click on Existing Book button to add a book that has book information in the database already

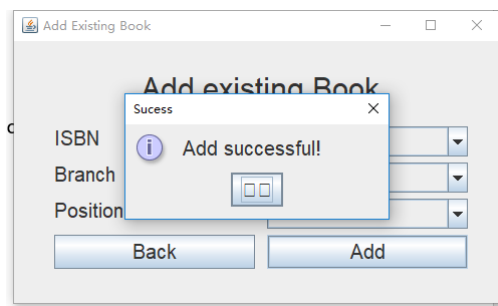


Choose the ISBN of the book, Branch you want add the book copy in and the position the branch to store the book

The position list is dynamic by the branch you choose, and it will only show the position that do not have a book



The click the add button



Database:

isbn	book_id
001004	186
001007	185

book table

book_id	branch_id	locator
186	1	001A01
186	1	002A02

location table



branch_id	isbn	num_copy
1	001004	1
1	2004	1

copy table

Click on Add new book button to add a book that does not have information in the library

Input and choose all required data and click add button to add.

Database:

Result Grid				Filter f
	author_id	name		
	17	Jie Ch...		
	16	Frank		

Author table

isbn	book_id
1111	187
001004	186

book table

isbn	title	publisher_id	publisher_date
1111	ABC	1	2018-05-03
004001	Look Back in Anger	14	2013-04-25

book_info table

branch_id	isbn	num_copy
1	001004	1
1	1111	1

copy table

Result Grid | Filter Rows: |

	book_id	branch_id	locator
	186	1	001A01
	187	1	001A02
	86	1	002A02

location table

3) Search book

Click on the search button to search book copies by title

The 'Search Book' window displays a search for the title 'Absalom, Absalom!'. The 'Book ID' and 'Status' columns are visible but empty.

Choose a title and click on search to search

The 'Search Book' window displays search results for the title 'Umamusume Pretty Derby'. The results are as follows:

Book ID	Status
15	Borrowed
16	Available
17	Available
18	Available
19	Available

You can see the status on each book copy

4) Add Reader

Click on add reader button to add a reader

The 'Add Reader' window contains three input fields for 'Name', 'Address', and 'Phone'. At the bottom, there are 'Back' and 'Add' buttons.

Input the data and click on add button to add

The 'Add Reader' form contains the following data:

Field	Value
Name	Jie Chong
Address	123 Broadway, New York
Phone	123456

A 'Success' dialog box is displayed with the message: 'Add successful!'.

Database

reader_id	name	address	phone
99032	Jie Chong	123 Broadway, New York	123456
99031	Alta J. Cream	3381 Pine Street New Kensington PA 15068	9175592321
99029	Carla R. Johnson	4677 Main Street Seattle WA 98119	9176841182

reader table

5) Branch

Click the branch button to see all branches information

Name	Location
Mebius	Downtown
Kratos	Mid West
Freya	Upper East
Autreus	Upper West
Baldur	Midtown
Mimir	Gramercy
Kramer	Kips Bay
Joyce	Murray Hill
Gvoza	Chinatown
Kimchi	K Town
Wall	Financial District
Battery	Battery Park
Shake	Harlem
Eataly	East Village
Lobster Tail	Chelsea
Dumbo	Brooklyn
Park Slope	Brooklyn
Sunny	Queens
Wood	Queens
Island	Roosevelt
Brooklyn College	Brooklyn

6) Top 10 Borrowers

Click on top 10 borrowers button to see top 10 most frequent borrowers on each branch

Choose the branch and click on search button

Top 10 Borrowers

Branch: Joyce

Search

No.	Reader ID	Count
1	59813	2
2	82525	2
3	89019	2
4	52026	1
5	99017	1
6	52027	1
7	70013	1
8	52523	1
9	72014	1
10	89013	1

Back

7) Top 10 books

Click on top 10 books to see the top 10 most frequent books to be borrowed on each branch

Choose the branch and click on the search button

Top 10 Books

Branch: Mebius

Search

Title
Umamusume Pretty Derby
Absalom, Absalom!

Back

8) Average Fine

Click on the average fine button to see the average fine on a specific reader

Average Fine

Reader ID: 99029

Search

Average Fine: 1.27

Back

Result Grid							Filter Rows:	Edit:
	book_id	reader_id	branch_id	b_date	r_date	fee		
	14	99029	3	2013-03-19	2013-04-03	0		
	25	99029	3	2013-01-20	2013-02-28	3.8		
	29	99029	19	2013-04-23	NULL	0		
	13	99017	8	2011-12-24	2012-01-31	3.6		
	24	99017	5	2012-02-05	2012-02-24	5.4		

borrow table

For user 99029, his average fine is $3.8 / 3 = 1.27$

The End!