

Archives of Babel

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Project Motivation

The problem being addressed is:

- Want to be able to organize the library (storage of locational information for books, dvds)
- Need better storage of transactional data for the library (returns, loans)
- Database will provide quicker access to book locations and customer/employee information
- Need to keep track of inventory so that librarians can see what the library needs more copies of and what are the most popular books

System Description

System usage and reasons the database solves the issues :

- Organizes data and allows members/librarians to access relevant information to them
 - Members can see the most borrowed books recently, while librarians can see important transactional information
- Utilizes the search bar to allow members and librarians to search through library in ways that solve their problems
 - Members and librarians find the information that is searched for
 - Members don't have to scan through a map to find where materials are stored
- Provides employees inventory information on books and DVDs
 - Provides answers for members if members aren't able to find the materials at the materials' locations

System Architecture

- SQLite as a DBMS
 - Cross-platform; no new hardware required in the library
 - Fast and serverless
 - Database can be stored on computers throughout the library which can be accessed by both members and staff of the library
- Front-End written in Java
 - Graphical User Interface (GUI) written in Java using Swing, which is the built in Java GUI toolkit
- How does everything “talk”?
 - Java Database Connectivity (JDBC) is an application programming interface (API) which allows a Java application to connect to the database, send queries, and receive the results

Database Design - Data Source

Sources for table:

- Tables that have randomly generated data:
 - Member
 - Employee
 - Location
 - Loan
 - Return
 - BookLine
 - DVDLine
- Data obtained from the Thomas Crane Public Library website (located in Quincy): (links are provided in the reference slide)
 - Book
 - DVD

Reports - Query #1

```
1  /*
2  Lists all employees by first name and last name that lent out books
3  and how many books they each lent out. Ordered by amount of books
4  lent out. This query helps management see which employees have been
5  most productive.
6
7  6-pt Query
8
9  1 pt - Motivation/Justification
10 2-pts - >2 tables joined
11 1-pt - Aggregate function
12 1-pt - Grouping
13 1-pt - Ordering fields
14
15 */
16
17 SELECT
18     Employee.EmployeeID AS ID, Employee.FirstName AS First_Name, Employee.LastName AS Last_Name,
19     COUNT(BookLine.BookLineID) as Books_Lent
20 FROM
21     (Employee INNER JOIN Loan ON Employee.EmployeeID=Loan.LibrarianID)
22     INNER JOIN BookLine ON Loan.LoanID=BookLine.LoanID
23 GROUP BY
24     Employee.EmployeeID
25 ORDER BY Books_Lent DESC;
```

Reports - Query #1 (Output)

Lists all employee IDs, first names, last names, and how many books they have lent out, ordered from greatest to least.

The report generated tells which employees have been able to loan out the most books.

	ID	First_Name	Last_Name	Books_Lent
1	8	alejandro	osborne	21
2	16	alan	thomas	17
3	11	louise	howard	15
4	7	francis	hernandez	11
5	12	debra	bennett	9
6	5	acora	gray	8
7	1	fernando	stephens	6
8	4	angel	james	6
9	18	roger	king	6
10	15	rose	moore	5
11	17	ashley	russell	5
12	10	randall	sullivan	4
13	9	kay	reid	3
14	14	william	kelly	3
15	19	pamela	washington	3
16	13	juan	bailey	2
17	2	causal	hust	1

Reports - Query #2

This query allows employees to find where a book that has been loaned out was located in the library

Benefit:

- Helps employees keep better inventory records and organize the library much more easily

```
1  /*
2      Where was the book located in the library that Kendall
3      Jenner took out on September 1st, 2016?
4
5      4-pt Query
6
7      1-pt - Motivation/Justification - When a book gets returned, an
8      employee can use this query to place the book back on the proper shelf
9      2-pts - >2 tables joined
10     1-pt - where/having conditions not for joins
11 */
12
13 SELECT
14     Book.Title AS Book_Title,
15     Location.Section AS Section, Location.RowNumber AS Row, Location.Shelf AS Shelf
16 FROM
17     ((Member INNER JOIN Loan ON Member.MemberID=Loan.MemberID)
18     INNER JOIN BookLine ON Loan.LoanID=BookLine.LoanID)
19     INNER JOIN Book ON BookLine.BookID=Book.BookID)
20     INNER JOIN Location ON Book.LocationID=Location.LocationID
21 WHERE
22     Member.FirstName LIKE 'Kendall' AND
23     Member.LastName LIKE 'Jenner' AND
24     Loan.LoanDate LIKE '2016-09-01';
```

	Book_Title	Section	Row	Shelf
1	The Magic of Gingerbread: 16 Beautiful Pr...	8	4	7

Query executed successfully: /*
Where was the book located in the library that Kendall
Jenner took out on September 1st, 2016?

Reports - Query #3

Archives of Babel

Archives of Babel - Li

Most Borrowed Books

Title:	First, Break All the Rules: What the World's Greatest	▲
Genre:	Business	
Recent Loans:	5	
Title:	The Treasure of the Sea: A Geronimo Stilton Adventu	
Genre:	Children's Chapter Books	
Recent Loans:	4	
Title:	All The Light We Cannot See	▼
Genre:	Fiction	

This query shows a list of the books that have been loaned out the most by using the data from the loan entity.

Benefits:

- Quick feeling to what the library is about
- Helps librarians determine what books the inventory should expand on
- Helps the user determine if Archive of Babels is the right database for them to use

Reports - Query #4

The screenshot shows a web application window titled 'Library Database'. At the top, there are two tabs: 'Front Page' and 'Employee Tools'. Below the tabs, the main heading is 'Library Database'. The content area contains the text 'Are the Archives of Babel right for you?' followed by the instruction 'Enter your favorite genre of books to find out what we have for you:'. There is a text input field containing the word 'Mystery' and a 'SEARCH' button. Below the search results, there is a table with two rows: 'Genre: Mystery' and '# of Books: 13'. The table has a scrollable area with up and down arrows on the right side.

Genre:	Mystery
# of Books:	13

This query helps the user see how many of the books Archives of Babel has for a specific genre.

Benefits:

- Shows a member if the library has a large selection of their favorite genre
- Quick feeling to what the library is about
- Helps librarians determine what books the inventory should expand on
- Helps the user determine if Archive of Babels is the right database for them to use

Reports - Query #5

This query runs upon opening the Employee section of the user-interface which gives employees the member's address information so a reminder letter can be sent out for overdue books/DVDs.

Benefits:

- Employees are able to see which members have frequently been late with their returns
- Helps librarians determine who to send our reminder letters to about overdue books/DVDS

Members' Late Returns	
Name:	vesta duchin
Days Late:	125
Address:	9 Wymans Beach Canyon Andover, massachusetts 01812
Name:	alexys van buren
Days Late:	55
Address:	57 Northeast Leehigh Alley Andover, massachusetts 01899
Name:	Mckenzie espenshade
Days Late:	31
Address:	1010 West Stayner Square Boxborough, massachusetts 01719
Name:	joe ganley
Days Late:	24
Address:	6578 Southeast El Arroyo Hanover, massachusetts 02339
Name:	Jessica hoshida
Days Late:	6
Address:	29 Sobo Grove Accord, massachusetts 02018
Name:	nathan dayie
Days Late:	4

Reports - Query #6

Transaction Search

Loan Information ▾

Mencken

Search By: ☐ Employee ID
☒ Member Last Name
(Choose ONE)

SEARCH

Book Title:	Black Panther: Who Is the Black Panther
Author:	Reginald Hudlin
Loan Date:	2016-11-28
Member:	sandy mencken
Book Title:	Scorched Earth: Restoring the Country After Obama
Author:	Michael Savage
Loan Date:	2016-11-27
Member:	sandy mencken
Book Title:	Scorched Earth: Restoring the Country After Obama
Author:	Michael Savage
Loan Date:	2016-11-27
Member:	sandy mencken
Book Title:	The Making of Donald Trump
Author:	David Cay Johnston
Loan Date:	2016-11-27
Member:	sandy mencken
Book Title:	The Bestseller Code: Anatomy of the Blockbuster Novel
Author:	Matthew L. Jockers
Loan Date:	2016-11-27
Member:	sandy mencken
Book Title:	The Treasure of the Sea: A Geronimo Stilton Adventure (Thea Stilton: Specia
Author:	Thea Stilton

This query shows a search that an employee might do to find out loans of a particular member, by searching by the member's last name.

Benefits:

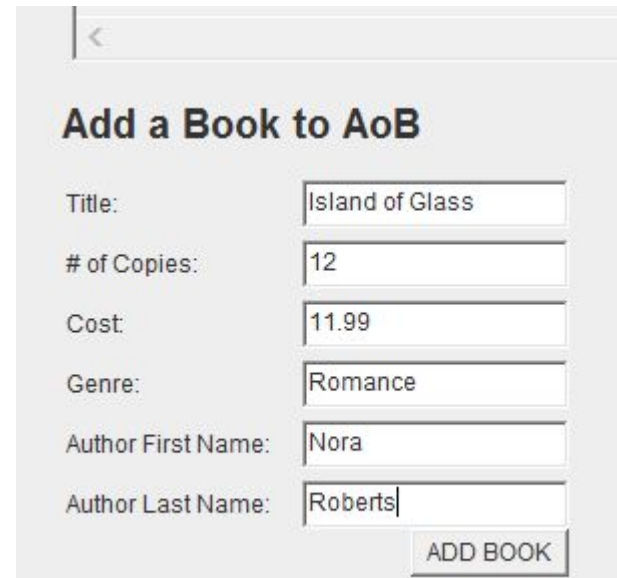
- Employees checking out past transactions
- Member requesting more information about a particular loan or return

Reports - Query #7

Gives employee users the ability to add books to the database. The query run in the backend automatically updates all corresponding tables with foreign keys.

Benefits:

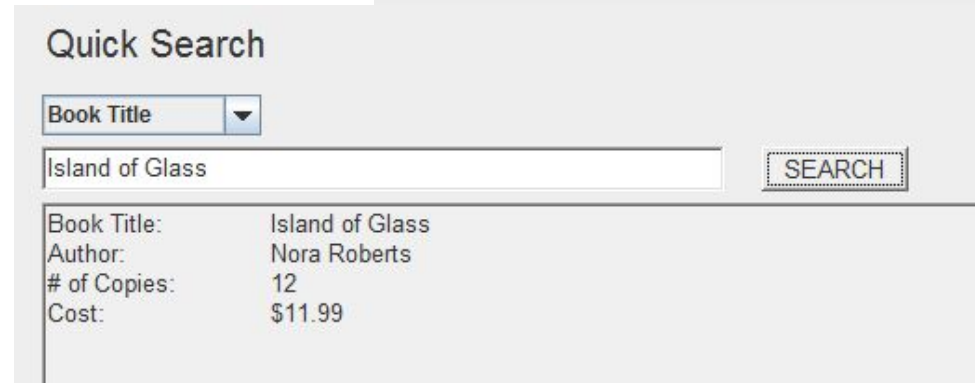
-Gives employees the ability to add new books to the library's database as they are added to the actual physical library



A screenshot of a web form titled "Add a Book to AoB". The form contains several input fields for book details: Title (Island of Glass), # of Copies (12), Cost (11.99), Genre (Romance), Author First Name (Nora), and Author Last Name (Roberts). An "ADD BOOK" button is located at the bottom right of the form.

Title:	Island of Glass
# of Copies:	12
Cost:	11.99
Genre:	Romance
Author First Name:	Nora
Author Last Name:	Roberts

ADD BOOK



A screenshot of a web interface titled "Quick Search". It features a dropdown menu for "Book Title" with "Island of Glass" selected. A "SEARCH" button is to the right. Below the search bar, a table displays the search results for the book "Island of Glass" by Nora Roberts.

Quick Search	
Book Title	Island of Glass
Author	Nora Roberts
# of Copies	12
Cost	\$11.99

Reports - Query #8

Gives employee users the ability to add a DVD to the database. Query automatically adds foreign keys to the corresponding tables in the backend.

Benefits:

-Gives employees the ability to add new DVDs to the library's database as they are added to the actual physical library

Add a DVD to AoB

Title:	<input type="text" value="Pulp Fiction"/>
# of Copies	<input type="text" value="6"/>
Producer:	<input type="text" value="Lawrence Bender"/>
Cost:	<input type="text" value="8.96"/>
Genre:	<input type="text" value="Thriller"/>

ADD DVD

Quick Search

DVD Title

SEARCH

DVD Title:	Pulp Fiction
Producer:	Lawrence Bender
# of Copies:	6
Cost:	8.96

References

- DVD data: <http://thomascranelibrary.org/movies/new>
- Book data: <http://thomascranelibrary.org/books/new>