

Kevin Braman
Grant Schaures
CS 340
Team #42
Team Forty-Two Database

Project Step Five Final Submission - Powell's Books

Link: <http://flip3.engr.oregonstate.edu:16914/books.hbs>

Please use the OSU VPN to connect to the website.

Executive Summary:

In the process of developing this project, multiple drafts were submitted for review to our classmates so that their feedback could be used to enhance the final product. This summary will trace and explain the development process from the initial draft. For step one, the feedback was centered on going into greater detail about the various aspects of the project as well as maintaining consistency. In response, we went into greater detail for the project overview as well as expanding the detail for entity attributes and relationships. We also fixed all necessary consistency errors, such as consistent capitalization and making sure all entity names were plural.

For step two of the project, feedback was centered around the necessity of certain attributes as well as adding appropriate SQL operations and improving the use of foreign keys. In response, we removed unnecessary attributes such as Book_sales, Author_books_published, & Customer_books_purchases. We also made genre_id a foreign key inside the Books table instead of the previous arrangement where book_id was a foreign key inside of the Genres table. Lastly we add CASCADE operations to the DDL.sql file.

For step three of the project, feedback was centered on adding more functionality to the intersection table, as well as adding NULLable relationships. In response, we added DELETE and UPDATE functionality to the books-authors intersection table, as well as adding DELETE statements to all other tables. We also made the phone number attribute for the Customers Entity NULLable. In addition, ON DELETE CASCADE was added to the Authors table in the DDL.sql so that if an author is deleted, the corresponding rows in the intersection table will also be deleted.

For step four of the project, feedback was centered on UI functionality, as well as certain aspects of CRUD for the books page. In response to the feedback, we updated the row names in the web page from their variable names to more appropriate titles. We also updated the genre drop down field to show the genre names as opposed to the genre ids, as well as making sure a check is in place for ISBNs to ensure uniqueness.. Lastly, we fixed the CRUD issues for the book page, namely the SEARCH functionality.

Project Outline:

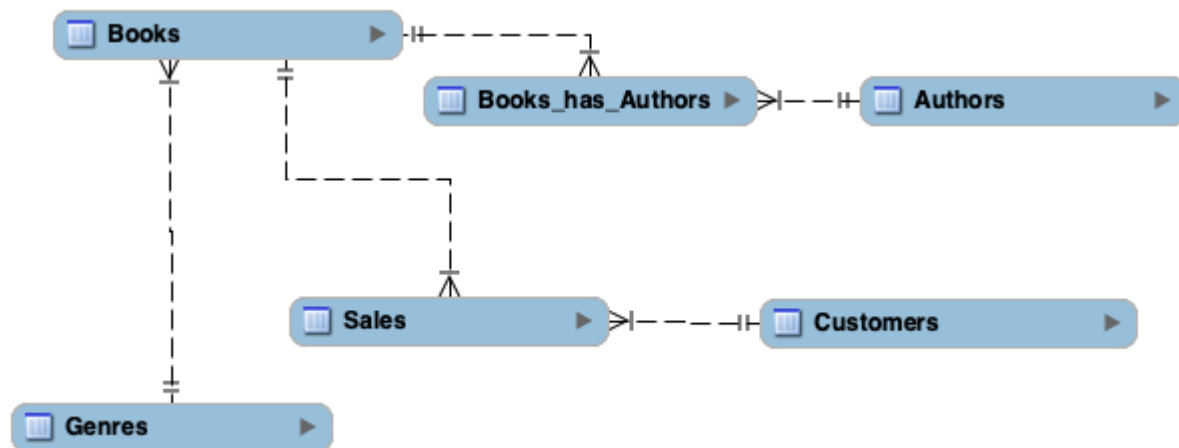
Powell's Books, the world's largest independent bookstore, currently houses over 1 million books in its central inventory located in the heart of Portland, Oregon. As the bookstore has gained traction in previous decades, its need for efficient data storage and manipulation has increased dramatically. With an average of over 250,000 books sold every year to 150,000 different customers, it stands to reason that a database driven website could prove to be indispensable for the business, insofar as it's able to maximize the efficiency of managing this vast amount of data related to books, authors, genres, customers, and sales. With over 1 million books in the central inventory, a robust database is going to be needed soon to help keep track of the books and organize them properly if Powell's Books intends to increase its stock more. If secondary locations are opened, a database will be absolutely crucial. A database will also help in figuring out which book titles and genres sell the most, allowing for more strategic purchasing decisions and thus greater profitability.

Database Outline:

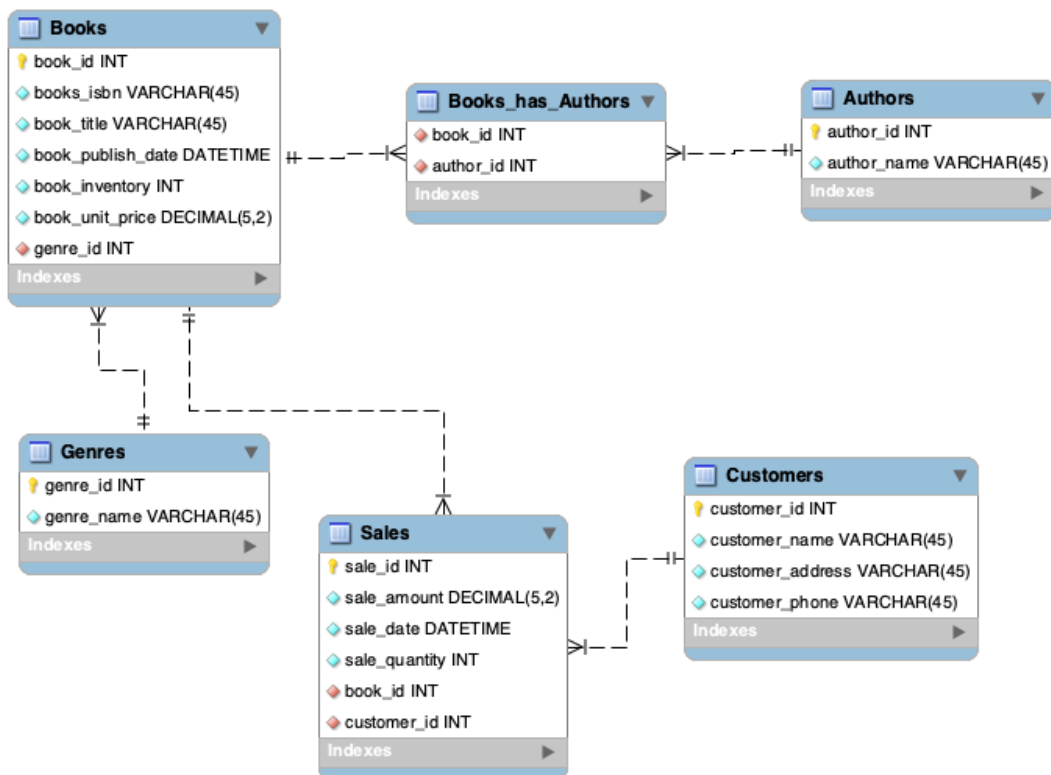
- **Books:** Records the details of a book sold by our business.
 - **book_id:** int, not_null, primary_key, unique, auto_increment. Represents the internal database id associated with the book.
 - **book_isbn:** varchar(45), not_null. Represents the ISBN number associated with the book.
 - **book_title:** varchar(45), not_null. Represents the book title.
 - **book_publish_date:** datetime, not_null. Represents the publishing date of the associated book.
 - **genre_id:** int, not null, foreign_key
 - **book_inventory:** int, not_null. Represents the current inventory.
 - **book_unit_price:** decimal(5,2), not_null. Represents the current unit price.
 - Relationships: A many-to-many relationship exists between Books and Authors, with the Books_has_Author table existing as an intermediary, as multiple authors can write multiple books, and books can have multiple authors. A one-to-many relationship exists between Books and Genres, as well as between Books and Sales. One book can have one genre, and multiple copies of a book can be sold. The key book_id exists as a foreign key in Books_has_Authors, Genres, and Sales.
- **Books_has_Authors:** Acts as an intermediary for the many-to-many relationship between Books & Authors.
 - **book_id:** int, foreign_key, not_null
 - **author_id:** int, foreign_key, not_null
- **Authors:** Records the details of a book's author.
 - **author_id:** int, primary_key, not_null, unique, auto_incremented. Represents the id associated with that author.

- **author_name:** varchar(45), not_null. Represents the author's name.
- **author_books_published:** int, not_null. Represents the count of books published by that author.
- **Relationships:** A many-to-many relationship exists between Books and Authors, with the Books_has_Author table existing as an intermediary, as an author can write many books and books can have more than one author.. The key author_id exists as a foreign_key within Books_has_Authors.
- **Genres:** Records the genres of books within inventory.
 - **genre_id:** int, primary_key, not_null, unique, auto_incremented. Represents the id associated with that genre.
 - **genre_name:** varchar(45), not_null. Represents the name associated with that genre.
 - **Relationship:** A one-to-many relationship exists between Books and Genres, where one book can have many genres.
- **Sales:** Records information about sales transactions.
 - **sale_id:** int, primary_key, not_null, unique, auto_incremented. Represents the sales id for a particular transaction.
 - **sale_amount:** decimal(5,2), not_null. Records the dollar amount of a particular transaction.
 - **sale_date:** datetime, not_null. Records the date of the transaction.
 - **sale_quantity:** int, not_null. Record the quantity of books sold during the transaction.
 - **book_id:** int, foreign_key, not_null
 - **customer_id:** int, foreign_key, not_null
 - **Relationship:** A one-to-many relationship exists between Books and Sales, with books_book_id existing as a foreign key, as a book and its copies can be sold many times. A one-to-many relationship exists between Sales and Customers, with customers_customer_id existing as a foreign key, as a customer can have many sales, but each sale is unique.
- **Customers:** Records information about customers.
 - **customer_id:** int, primary_key, not_null, unique, auto_incremented. Represents the id associated with a particular customer.
 - **customer_name:** varchar(45), not_null. Records the customer's name.
 - **customer_address:** varchar(45), not_null. Records the customer's address.
 - **customer_phone:** varchar(45). Records the customer's phone number.
 - **Relationships:** A one-to-many relationship exists between Sales and Customers, with customer_id existing as a foreign key, as a customer can have many sales, but each sale is unique.

Entity Relationship Diagram



Schema



Sample Data and Screen Captures:

Table: Books						
book_id	book_isbn	book_title	book_publication_date	genre_id	book_inventory	book_unit_price
1	978-0316769488	The Catcher in the Rye	1951-07-16 00:00:00	1	2500	8.93
2	978-0446310789	To Kill a Mockingbird	1960-07-11 00:00:00	1	7000	11.49
3	978-0812550702	Ender's Game	1985-01-15 00:00:00	2	700	7.27
4	978-0451524935	1984	1949-06-08 00:00:00	3	1250	7.48
5	9780451526342	Animal Farm	1945-08-17 00:00:00	3	1000	6.99

Table: Authors	
author_id	author_name
1	J.D. Salinger
2	Harper Lee
3	Orson Scott Card
4	George Orwell

Table: Books_has_Authors	
book_id	author_id
1	1
2	2
3	3

4	4
5	4

Table: Genres	
genre_id	genre_name
1	Drama
2	Sci-Fi
3	Political
4	Horror
5	Romance

Table: Customers			
customer_id	customer_name	customer_address	customer_phone
1	John Doe	1000 Nowhere St	458-973-5598
2	Jane Doe	2500 Anywhere Drive	503-675-4299
3	Alan Wake	1875 Bright Falls	202-876-5054
4	Henry Townshead	9753 Centre St	570-893-9903

Table: Sales					
sale_id	sale_amount	sale_date	sale_quantity	book_id	customer_id
1	17.86	2022-06-17 00:00:00	2	1	3
2	6.99	2004-06-17 00:00:00	1	5	4
3	7.27	2012-12-12 00:00:00	1	3	2

Books (SEARCH/CREATE/UPDATE/DELETE)

EST. 1971
POWELL'S
CITY BOOKS

HomeBooksAuthorsGenresCustomersSalesBooks-Authors

Books

book_id	book_isbn	book_title	author_name	book_publish_date	book_inventory	book_unit_price	genre_name	delete
1	978-0316769488	The Catcher in the Rye	J.D. Salinger	Mon Jul 16 1951 00:00:00 GMT-0700 (Pacific Daylight Time)	2500	8.93	Drama	<button>delete</button>
2	978-0446310789	To Kill a Mockingbird	Harper Lee	Mon Jul 11 1960 00:00:00 GMT-0700 (Pacific Daylight Time)	7000	11.49	Drama	<button>delete</button>
3	978-0812550702	Ender's Game	Orson Scott Card	Tue Jan 15 1985 00:00:00 GMT-0800 (Pacific Standard Time)	700	7.27	Sci-Fi	<button>delete</button>
5	978-0451526342	Animal Farm	George Orwell	Fri Aug 17 1945 00:00:00 GMT-0700 (Pacific Daylight Time)	1000	6.99	Political	<button>delete</button>
8	123-456789	Another Book	Albert Camus	Wed Aug 23 2023 00:00:00 GMT-0700 (Pacific Daylight Time)	3000	23.99	Science	<button>delete</button>

Search Books

Book Title:

SearchReset

Books page SEARCH/DELETE functionality.

Create Book

Book ISBN: *Required

Book Title: *Required

Select Author: *Required

Publish Date: *Required

Book Inventory: *Required

Unit Price: *Required

Select Genre: *Required

CreateCancel

Books page CREATE functionality.

Update Book

Select Book ID: *Required

Book ISBN: *Required

Book Title: *Required

Select Author: *Required

Publish Date: *Required

Book Inventory: *Required

Unit Price: *Required

Select Genre: *Required

UpdateCancel

Books page UPDATE functionality.

Authors (SEARCH/ADD/DELETE)



Home Books Authors Genres Customers Sales Books-Authors

Authors

author_id	author_name	delete
1	J.D. Salinger	<button>delete</button>
2	Harper Lee	<button>delete</button>
3	Orson Scott Card	<button>delete</button>
4	George Orwell	<button>delete</button>
5	Albert Camus	<button>delete</button>
6	James Clear	<button>delete</button>
7	Albert Camus	<button>delete</button>

Search Author

Author:

Search Reset

Authors page SEARCH/DELETE functionality.

Add Author

Author Name: *Required

Add Cancel

Authors page ADD functionality.

Genres (ADD/DELETE)

EST. 1971
POWELL'S
CITY BOOKS

HomeBooksAuthors**Genres**CustomersSalesBooks-Authors

Genres

genre_id	genre_name	delete
1	Drama	<button>delete</button>
2	Sci-Fi	<button>delete</button>
3	Political	<button>delete</button>
4	Horror	<button>delete</button>
5	Romance	<button>delete</button>
6	Philosophy	<button>delete</button>
7	Science	<button>delete</button>
8	Arts	<button>delete</button>
9	Music	<button>delete</button>

Add Genre

Genre: *Required

AddCancel

Genres page ADD/DELETE functionality.

Customers (SEARCH/ADD/UPDATE/DELETE)

EST. 1971
POWELL'S
CITY OF BOOKS

HomeBooksAuthorsGenresCustomersSalesBooks-Authors

Customers

customer_id	customer_name	customer_address	customer_phone	delete
1	John Doe	1000 Nowhere St	458-973-5598	<button>delete</button>
2	Jane Doe	2500 Anywhere Drive	503-675-4299	<button>delete</button>
3	Alan Wake	1875 Bright Falls		<button>delete</button>
5	Your Mom	1234 Your Moms House		<button>delete</button>

Search Customer

Customer Name:

SearchReset

Customers page SEARCH/DELETE functionality.

Add Customer

Customer Name: *Required

Customer Address: *Required

Customer Phone Number:

AddCancel

Update Customer Info

Select Customer ID: *Required

Customer Name: *Required

Customer Address: *Required

Customer Phone Number:

UpdateCancel

Customers page ADD/UPDATE functionality. Phone numbers for customers are NULLable.

Sales (SEARCH/CREATE)

EST. 1971
POWELL'S
CITY OF BOOKS

HomeBooksAuthorsGenresCustomersSalesBooks: Authors

Sales

sale_id	book_title	customer_name	sale_amount	sale_date	sale_quantity
1	The Catcher in the Rye	John Doe	17.86	Fri Jun 17 2022 00:00:00 GMT-0700 (Pacific Daylight Time)	2
2	Animal Farm	Jane Doe	6.99	Thu Jun 17 2004 00:00:00 GMT-0700 (Pacific Daylight Time)	1
3	Ender's Game	Alan Wake	7.27	Wed Dec 12 2012 00:00:00 GMT-0800 (Pacific Standard Time)	1

Search Sale

Sale ID:

SearchReset

Sales page SEARCH functionality.

Create Sale

Select Book:

Select a Book

*Required

Select Customer:

Select a Customer

*Required

Sale Amount:*Required

Sale Date:

mm/dd/yyyy

*Required

Sale Quantity:*Required

CreateCancel

Sales page CREATE functionality.

Books-Authors (M:M Relationship)

EST. 1971
POWELL'S
CITY OF BOOKS

HomeBooksAuthorsGenresCustomersSalesBooks-Authors

Books & Authors

book_author_id	book_title	
1	The Catcher in the Rye	J.D. Salinger
2	To Kill a Mockingbird	Harper Lee
3	Ender's Game	Orson Scott Card
5	Animal Farm	George Orwell
8	Another Book	Albert Camus
11	1984	George Orwell

© Powell's Books Database Interface - Created by Team #42

The Books-Authors page showcases the M:M relationship between books and authors.