
DATABASE DESIGN(THE BOOK STORE)

Information Engineering

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Introduction

The task presented for this report was to build a database system for a bookstore in Swansea called Dylan's Book Store. The basis of this database is to allow the users to record their books, customers, staff, suppliers and their orders for suppliers and from customers.

Design

The first step was to design an entity relationship diagram of the tables to be made. The following is the diagram created:

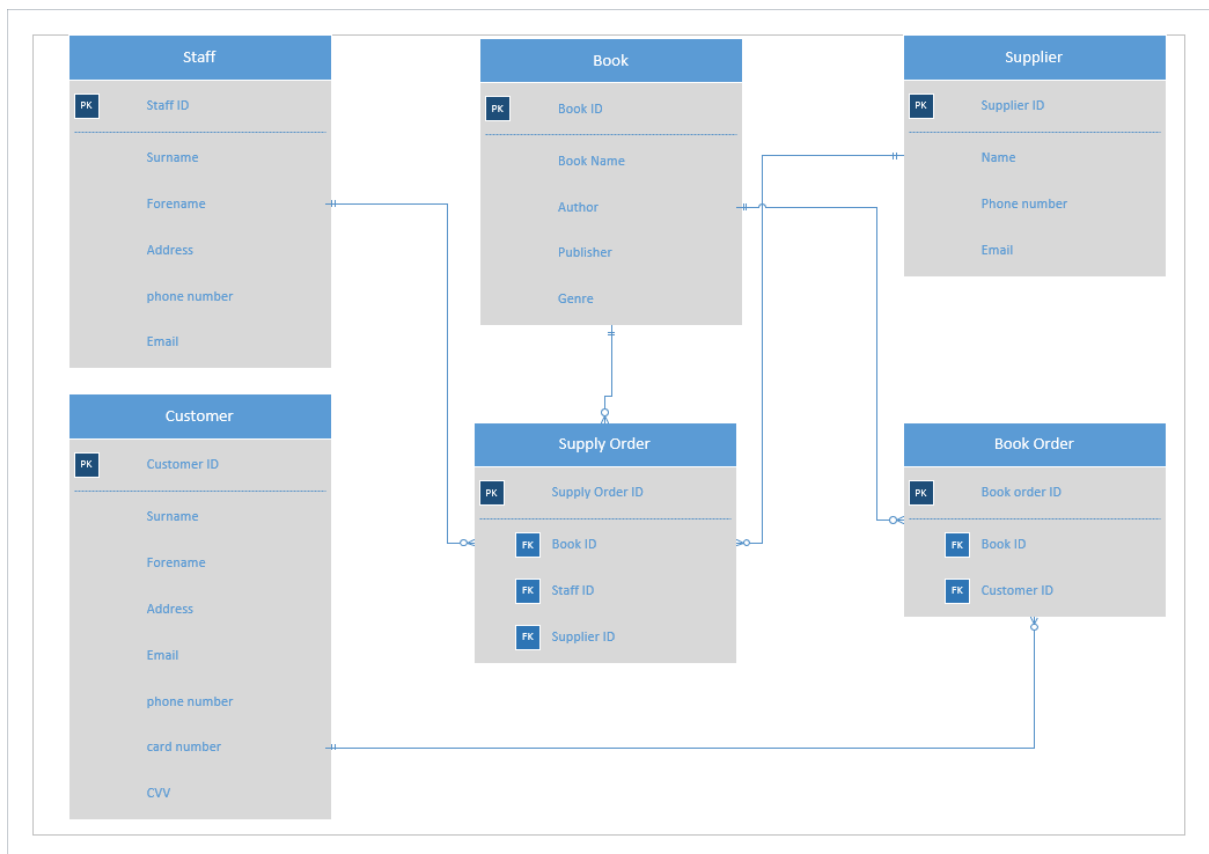


Figure 1:ERD

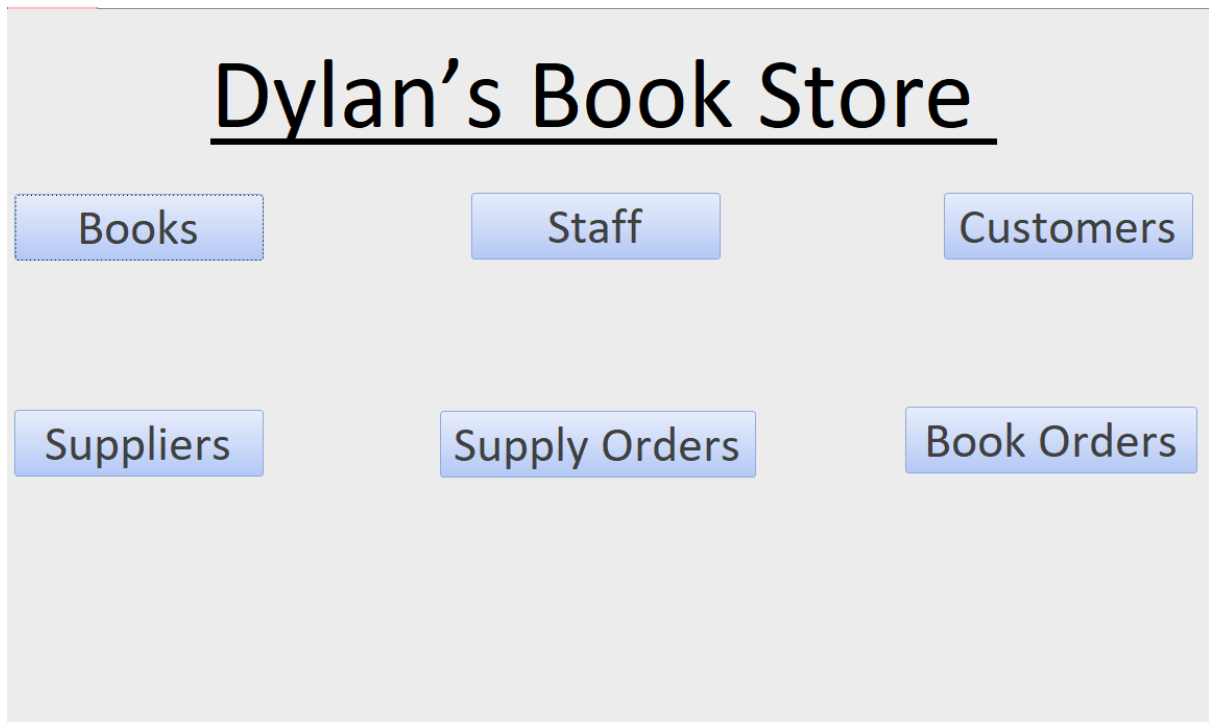
Here we have 6 tables: Books, staff, supplier, customer, supply order and book order. Each table has their own unique ID to be their primary key. In terms of the relationships. Books have a one-to-many relationship with supply order and book order, having book ID as a foreign key in both. Staff have a one-to-many relationship with just supply order as the database will need to keep track of which staff is carrying out the supply orders. It has its primary key of Staff ID as a foreign key within the supply order table. Next is customer, which has a one-to-many with just book order as these are the book orders from specific customers, customer's primary key is used here as a foreign key. Lastly, we have supplier, which has a one-to-many relationship with supply order, so the users make sure to know which supplier they are ordering from, thus supplier ID is used as a foreign key in Supply Order.

Implementation

Following the guidelines of the entity relationship diagram the tables were made, though an additional attribute of “Stock” was added to the Books table. After that the forms were created for a more suitable user interface.

Forms

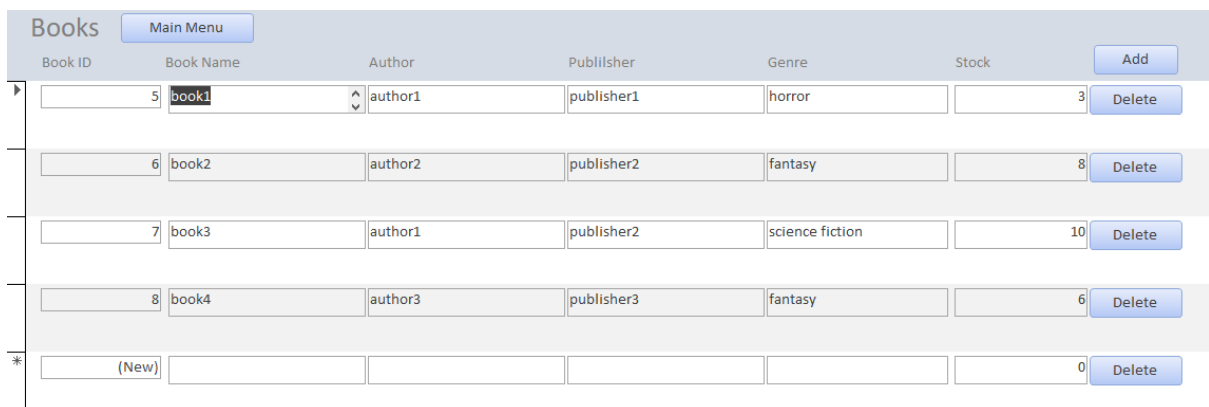
The first form a user shall be greeted by when first opening the database is the Main Menu form shown below:



The Main Menu form for Dylan's Book Store features a large title "Dylan's Book Store" at the top. Below the title, there are six buttons arranged in two rows of three. The buttons are labeled "Books", "Staff", "Customers" in the top row, and "Suppliers", "Supply Orders", "Book Orders" in the bottom row. All buttons are blue with white text.

Figure 2:Main Menu Form

This form is comprised of the Name of the company, being Dylan's Book Store, and six buttons for the user to navigate to all the appropriate tables. If the user clicks on the Books button, they are sent to the view books from:



The View Books form displays a table with columns: Book ID, Book Name, Author, Publisher, Genre, and Stock. There are four data rows and one new row at the bottom. Each row has a "Delete" button. The "Book Name" column has a dropdown arrow next to the text. The "Stock" column has a numeric input field.

Book ID	Book Name	Author	Publisher	Genre	Stock	
5	book1	author1	publisher1	horror	3	Delete
6	book2	author2	publisher2	fantasy	8	Delete
7	book3	author1	publisher2	science fiction	10	Delete
8	book4	author3	publisher3	fantasy	6	Delete
(New)					0	Delete

Figure 3:View Books Form

Figure 4: View Books Form

Here the user is shown the list of books currently stored in the database, with all their details from their ID to the amount of stock available. Here they may also edit any information on the books, such as changing the stock available. In this form there are three buttons available, Main Menu, Add, and Delete. If the user presses the Main Menu button, they will simply return to the start page with the six buttons, if they press a Delete button the book to the left of the button pressed will be removed from the database. Finally, if the user presses the Add button, they will add whatever was typed into the blank section into the database.

Going back to the main menu, if the user presses the staff button, they are redirected to this form:

The Staff form has a header bar with a 'Main Menu' button. Below it is a table with columns: Staff ID, Surname, Forename, Address, Telephone, Email, and an 'Add' button. The first row shows Staff ID 1, Surname Johnson, Forename Jon, Address someplace, Telephone 1234567893, and Email something@gmail.com. A 'Delete' button is to the right of the first row. Below the table is a row for adding new staff with a '(New)' label, input fields for Surname, Forename, Address, Telephone (with a '0' in the field), and Email, followed by a 'Delete' button.

Figure 5: View Staff Form

Every form other than the main form functions in the same way as the Books form, including adding and deleting data, and navigating back to the main menu.

The Customers form has a header bar with a 'Main Menu' button. Below it is a table with columns: Customer ID, Surname, Forename, Address, Email, Telephone, Card Number, CVV, and an 'Add' button. The first row shows Customer ID 2, Surname Power, Forename Max, Address somewhere, Email thingb@hotmail.com, Telephone 87654232443, Card Number 1111222233334440, and CVV 660. A 'Delete' button is to the right of the first row. Below the table is a row for adding new customers with a '(New)' label, input fields for Surname, Forename, Address, Email, Telephone, Card Number, and CVV, followed by a 'Delete' button.

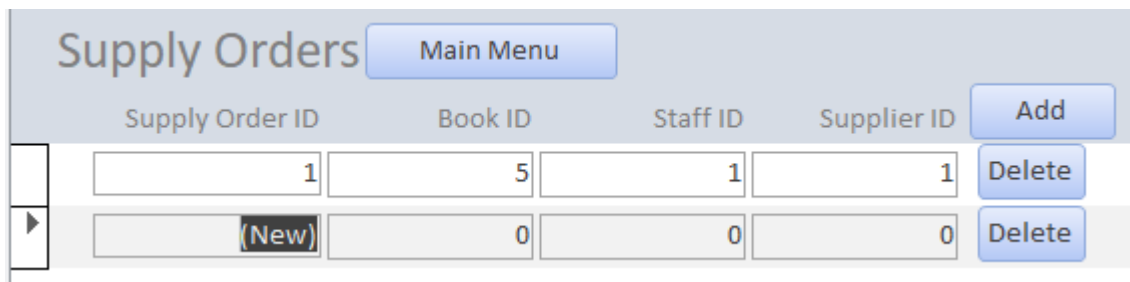
Figure 6:View Customers

The Suppliers form has a header bar with a 'Main Menu' button. Below it is a table with columns: Supplier ID, Supplier Name, Telephone, Email, and an 'Add' button. The first row shows Supplier ID 1, Supplier Name Amazon, Telephone 6784847480, and Email dhsdhtsht@ytduj.com. A 'Delete' button is to the right of the first row. Below the table is a row for adding new suppliers with a '(New)' label, input fields for Supplier Name, Telephone (with a '0' in the field), and Email, followed by a 'Delete' button.

Figure 7: View supplier Form

The Orders form has a header bar with a 'Main Menu' button. Below it is a table with columns: Book Order ID, Book ID, Customer ID, and an 'Add' button. The first row shows Book Order ID 1, Book ID 5, and Customer ID 2. A 'Delete' button is to the right of the first row. Below the table is a row for adding new orders with a '(New)' label, input fields for Book Order ID, Book ID (with a '0' in the field), and Customer ID (with a '0' in the field), followed by a 'Delete' button.

Figure 8:View Orders Form



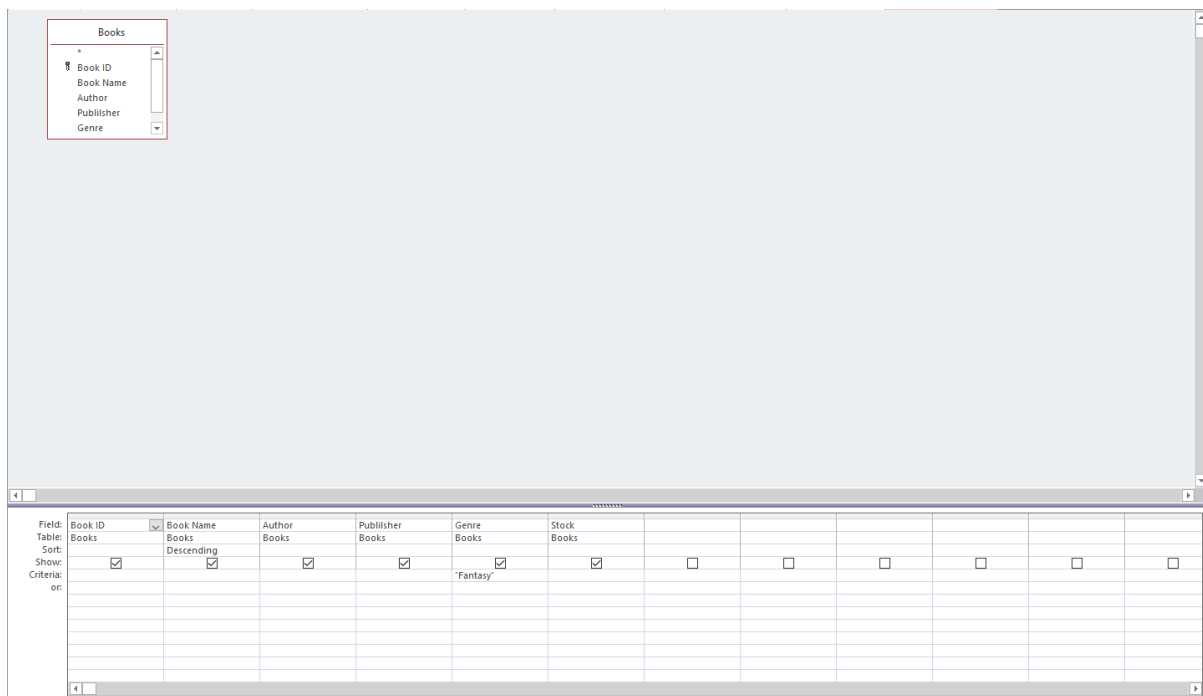
The form is titled "Supply Orders" and has a "Main Menu" button. It contains a table with columns: Supply Order ID, Book ID, Staff ID, and Supplier ID. There are "Add" and "Delete" buttons for each row.

	Supply Order ID	Book ID	Staff ID	Supplier ID	
	1	5	1	1	Delete
▶	(New)	0	0	0	Delete

Figure 9: View Supply Orders Form

Queries

Currently the database has one example query, and that's to search through the books and return the ones listed as the Fantasy genre, here is said query in design view:



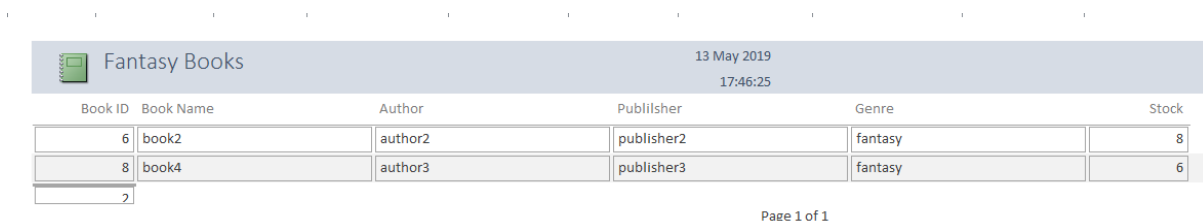
The design view shows a query named "Fantasy" with the following fields: Book ID, Book Name, Author, Publisher, Genre, and Stock. The criteria for the query are: Book Name is "Fantasy".

Field:	Book ID	Book Name	Author	Publisher	Genre	Stock
Table:	Books	Books	Books	Books	Books	Books
Sort:		Descending				
Show:	☒	☒	☒	☒	☒	☒
Criteria:		"Fantasy"				

Figure 10:Fantasy Query

Reports

Next for an example report, a report was made from the results of the query above:



The report is titled "Fantasy Books" and shows the results of the query. It includes a header with the date "13 May 2019" and time "17:46:25". The report displays a table with columns: Book ID, Book Name, Author, Publisher, Genre, and Stock.

Book ID	Book Name	Author	Publisher	Genre	Stock
6	book2	author2	publisher2	fantasy	8
8	book4	author3	publisher3	fantasy	6

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Figure 11:Fantasy Report

Relationships

The relationships made within access follow the same structure and guidelines of the entity relationship diagram made at the start. Here is a screen cap of the relationships made in access:

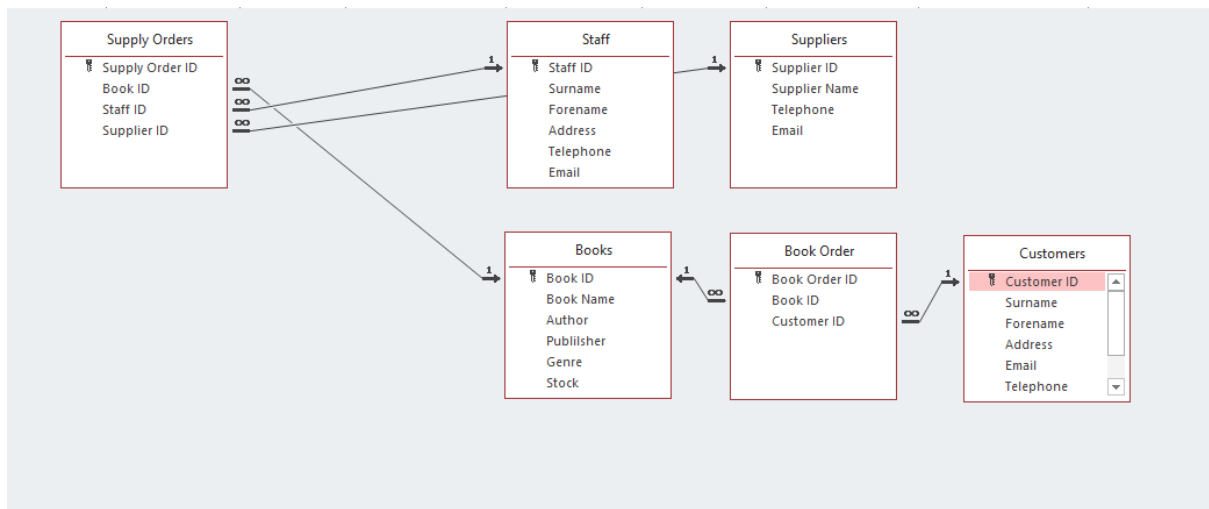


Figure 12: Access Relationships