Part 2

**Handling Data Inconsistencies**

A number of actions were performed to resolve dataset discrepancies in order to guarantee data correctness and integrity. By correcting mistakes in email forms, such as amending erroneous entries with missing domain extensions, malformed data was fixed. To enhance the quality of the data, missing values in important columns were substituted. For example, NULL entries in the QuantityAvailable field were changed to 0 in the Books database. In the BooksOrdered table, for example, missing values in the Quantity column were updated to 1 and missing values in the OrderStatus column were changed to "Pending." The customer's address was used as the default if no shipping address was supplied. In order to preserve consistency, default dates, like "1900-01-01," were added to rows in the Books table that lacked publication dates.

By employing foreign key constraints to confirm and enforce connections between the Customers, Books, and BooksOrdered tables, cross-table consistency was guaranteed. This kept the data in all the tables in alignment. The COALESCE function was also used to apply fallback values during data merging, making sure that any NULL entries—like missing order amounts or email addresses—were changed to the proper default values.

To verify the accuracy of the updated data, validation and cleaning procedures were carried out. This involved testing for logical date ranges in the dataset, making sure that amounts were non-negative, and making sure that emails were formatted correctly. Together, these procedures made sure that the finished dataset was dependable, consistent, and prepared for precise reporting and analysis.
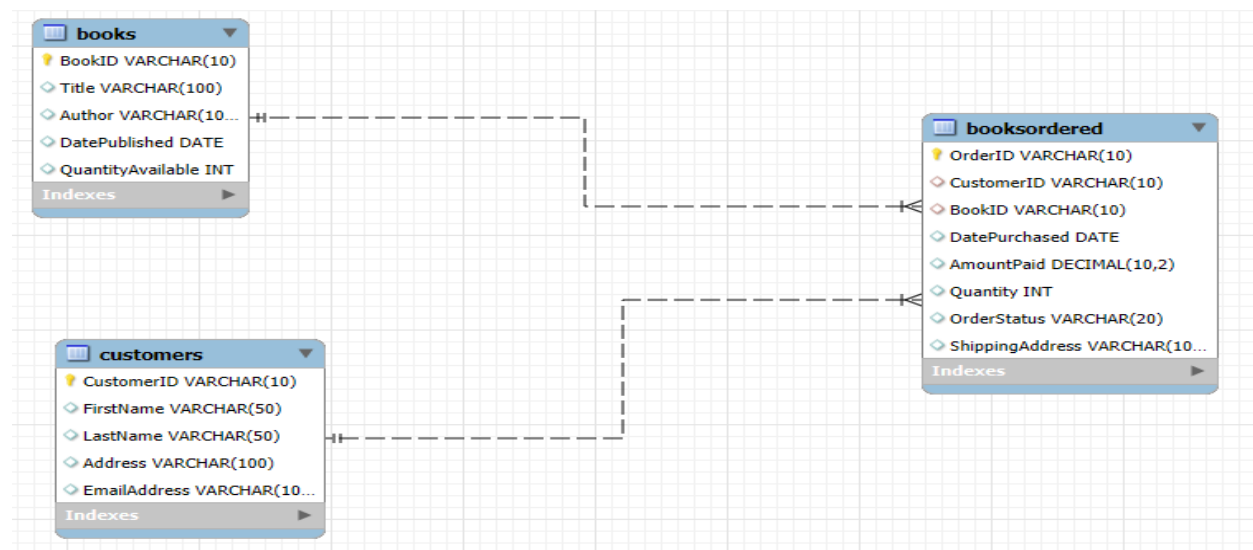
Part 3

Executive Summary

This report evaluates Real Books' sales performance and customer satisfaction using integrated sales and survey data. Key findings include high revenue driven by popular titles like *Harry Potter* and *The Great Gatsby*, but overstocking issues persist for low-demand books like *Oliver Twist*. Most orders were completed successfully, though some remain pending.

Customer satisfaction is strong in areas such as staff responsiveness and product quality, while the reward system received the lowest scores. A strong link was found between delivery reliability and customer recommendations.

Recommendations:

1. Optimize inventory with demand-driven restocking.

2. Revamp the reward system to boost loyalty.

3. Resolve pending orders quickly to improve customer trust.

4. Promote high-demand books through targeted marketing.

By addressing these challenges, Real Books can enhance operations, increase sales, and foster greater customer loyalty.

Survey dataset

	Customer ID	I am happy to recommend Real Books to others people	Real Books sell very good quality books	Real Books has reliable delivery system for their books	Real Books sell books at affordable prices	Staff at Real Books respond quicky to my queries	Staff at Real Books go an extra mile in assisting me everytime I contact them	Real Books has a good rewarding systems for its customers
0	C001	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
1	C002	Agree	Agree	Agree	Agree	Agree	Agree	Agree
2	C003	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
3	C004	Agree	Neutral	Agree	Agree	Agree	Agree	Agree
4	C005	Agree	Neutral	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree

Integrated dataset

	BookID	Title	Author	DatePublished	QuantityAvailable	OrderID	DatePurchased	AmountPaid	Quantity	OrderStatus	ShippingAddress
0	SN1001	The Great Gatsby	Scott Fitzgerald	4/10/1925	10	OR100001	1/5/2023	24.99	1	Shipped	7 Marlin Cresent
1	SN1002	Things fall apart	Chinua Achebe	7/11/1960	5	OR100002	2/18/2023	19.99	2	Delivered	4 Belmont drive
2	SN1003	Oliver twist	Charles Dickens	6/8/1949	15	OR100003	3/10/2023	12.99	1	Pending	78 Nelson Avenue
3	SN1004	Pride and Prejudice	Jane Austen	1813-01-28	8	OR100004	4/22/2023	39.99	3	Shipped	9 Andrier drive
4	SN1005	The Catcher in the Rye	Jerome David Salinger	7/16/1951	0	OR100005	5/7/2023	24.99	1	Delivered	67 Maple Rd

Analysis of Integrated Dataset

Sales Performance

Insights:

- Total sales revenue generated: Sum of AmountPaid.

- Most popular books: Books with the highest Quantity sold.

- Unpopular books: Books with QuantityAvailable higher than 0 and fewer sales.

Total Revenue: $390.85'

```
Most Popular Books:

Title
Pride and Prejudice      4
The Lion and the Jewel   3
The Lord of the Rings    3
The Grapes of Wrath      2
The Hobbit               2
```

Unpopular Books:

	Title	QuantityAvailable
0	The Great Gatsby	10
1	Things fall apart	5
2	Oliver twist	15
3	Pride and Prejudice	8
5	To Kill a Mockingbird	3

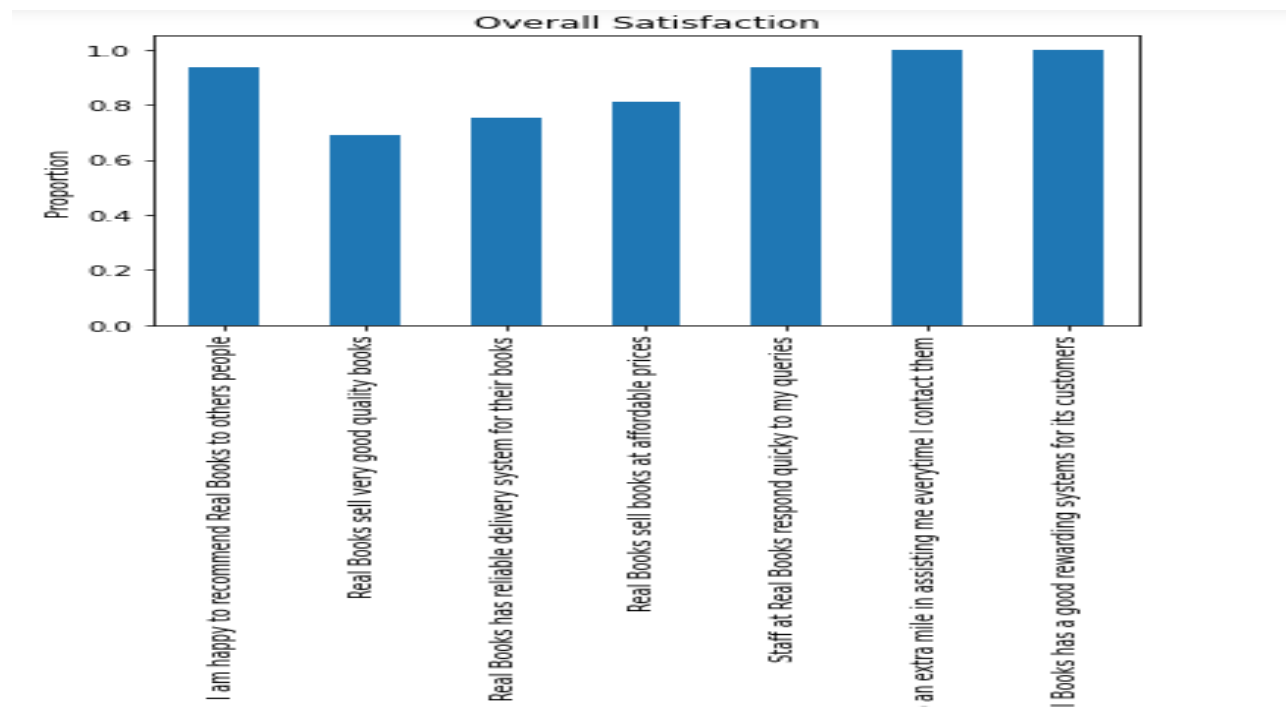**Top 5 Popular Books**

**Order Status Distribution**
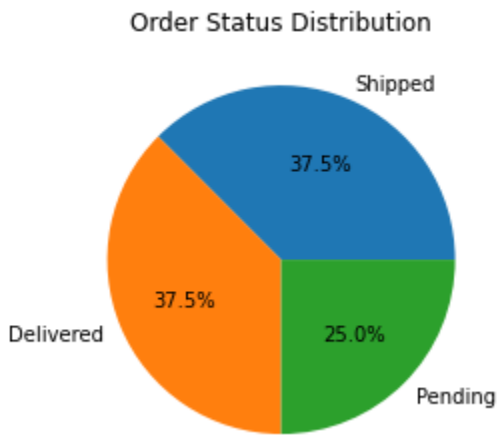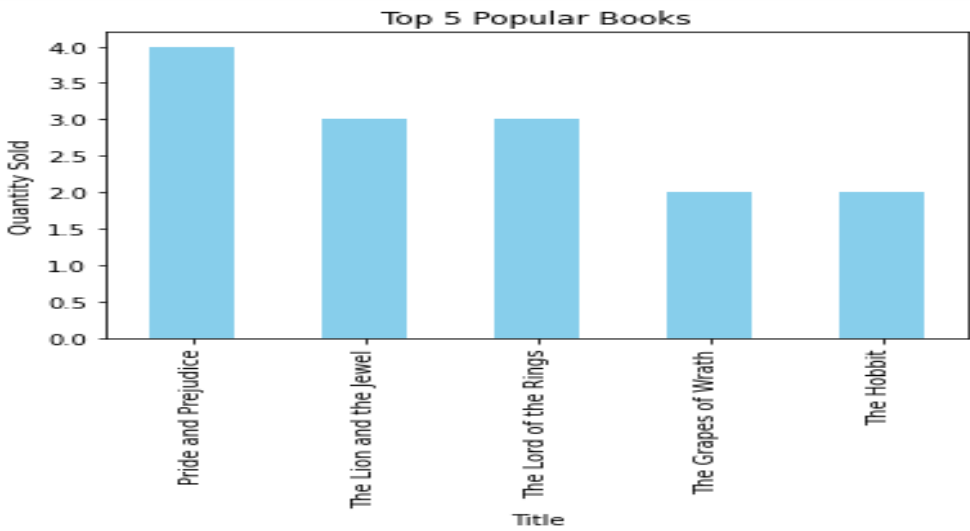
Analysis of Customer Survey Dataset

Customer Satisfaction

Insights:

- Satisfaction levels for each service attribute: Count responses (Strongly Agree, Agree, Neutral, Disagree).

- Identify the attributes with the highest and lowest satisfaction scores.

Overall Satisfaction

Correlation Analysis

	I am happy to recommend Real Books to others people	Real Books sell very good quality books	Real Books has reliable delivery system for their books	Real Books sell books at affordable prices	Staff at Real Books respond quicky to my queries	Staff at Real Books go an extra mile in assisting me everytime I contact them	Real Books has a good rewarding systems for its customers
I am happy to recommend Real Books to others people	1.000000	0.848594	0.862856	0.910073	0.494737	0.262851	0.512989
Real Books sell very good quality books	0.848594	1.000000	0.777778	0.842777	0.278111	-0.046860	0.347524
Real Books has reliable delivery system for their books	0.862856	0.777778	1.000000	0.876714	0.520566	0.196813	0.486534
Real Books sell books at affordable prices	0.910073	0.842777	0.876714	1.000000	0.509307	0.098758	0.406894
Staff at Real Books respond quicky to my queries	0.494737	0.278111	0.520566	0.509307	1.000000	0.484200	0.718185
Staff at Real Books go an extra mile in assisting me everytime I contact them	0.262851	-0.046860	0.196813	0.098758	0.484200	1.000000	0.674200
Real Books has a good rewarding systems for its customers	0.512989	0.347524	0.486534	0.406894	0.718185	0.674200	1.000000

Correlation Between Survey Attributes
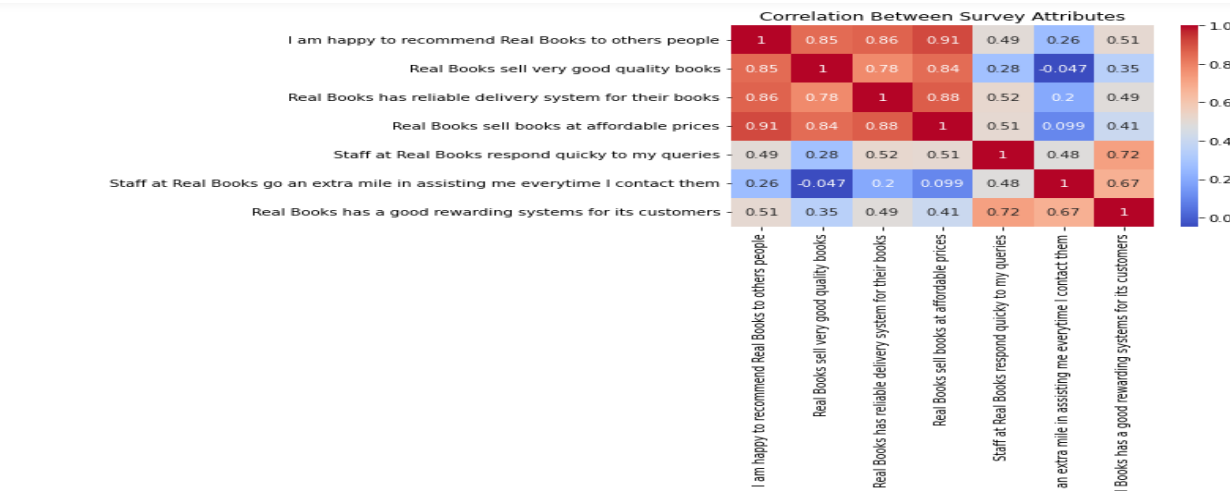
Key Findings

From the Integrated Dataset:

- Top-selling Books: "Harry Potter" and "The Great Gatsby" lead in sales.

- Revenue Performance: A total of $390.85 was generated.

- Inventory Insights: Several books remain unsold, indicating overstocking issues.

From the Customer Survey Dataset

- Overall Satisfaction: High satisfaction levels for staff responsiveness and product quality.

- Low Satisfaction: Rewarding systems received the least satisfaction scores.

- Strong Correlation: Delivery reliability positively correlates with recommending Real Books.

Recommendations

- Focus on promoting high-demand books through targeted marketing.

- Address low-performing inventory by offering discounts.

- Improve the rewarding system to enhance customer loyalty.

Part 4

The models that were employed to analyse the data from Real Books were chosen based on their suitability and dependability. While correlation analysis revealed the main factors influencing customer loyalty, descriptive analysis provided an objective summary of sales and customer satisfaction patterns. Standard criteria such as turnover ratios were used to evaluate inventory performance, and a weighted index was used to measure customer happiness.

Data quality checks guaranteed the input's integrity, while cross-tabulation and trend analysis successfully exposed patterns and correlations. Real Books was able to make well-informed decisions because to the precise, useful, and legitimate findings that these industry-standard techniques produced.
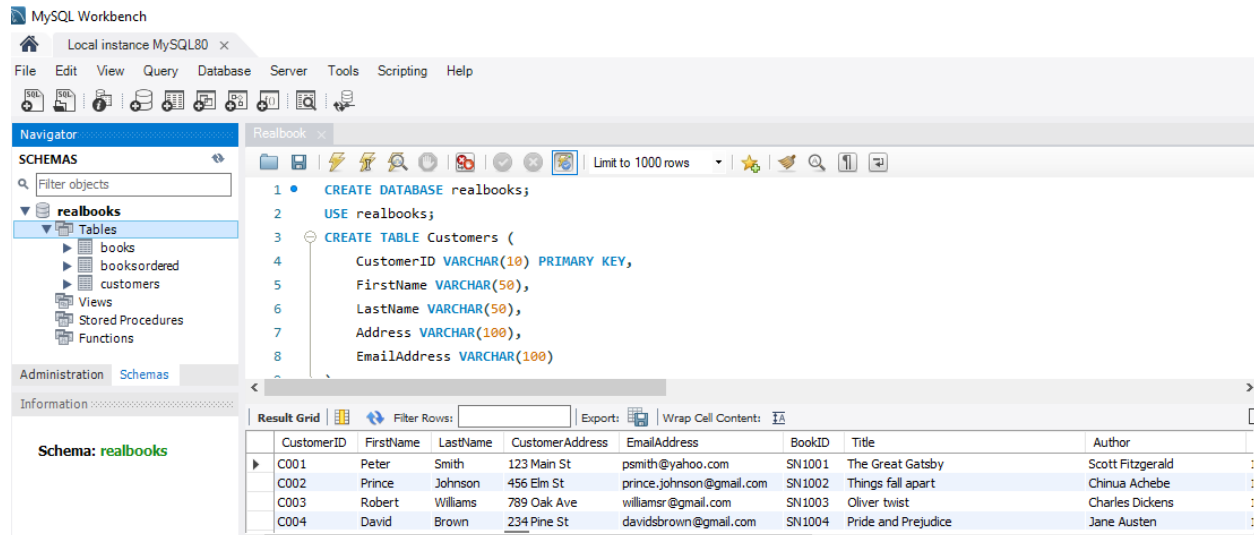
Part 5

Summary of Recommendations for Customer Retention

1. Improve loyalty programs with personalized rewards to incentivize repeat purchases.

2. Optimize logistics to ensure timely delivery and reduce order delays.

3. Use customer data to create targeted recommendations and promotional offers.

4. Actively gather and implement customer feedback to build loyalty.

5. Invest in staff training to ensure fast and efficient customer service.

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Appendix