Library Management System-
SQL Project

Findings

1. Total Number of Books in the Library
2. Total Number of Members in the Library
3. Total Number of Employees in the Library
4. Total Number of Branches
5. Books Currently available for rent
6. Find out the book with the highest rental price.
7. A People History of the united states is the highest rental price book.
8. Total Revenue from Book Rentals
9. Which book has been borrowed the most (based on issue records)?
10. Find which member has issued the most books.
11. Which branch has the most issued books? or Most Active Branch
12. Which employee has issued the most books?
13. Find the number of books issued between two specific dates.
14. Find the total number of books in each category.
15. List employees working in each branch along with their positions.
16. Calculate the total rental income per book category.
17. Identify the top 3 highest-paid employees.
18. Find members who have not issued any books.
19. List books that have never been issued.
20. Calculate the average rental price of books per publisher.
21. Find the number of books issued by each employee.
22. Find the latest return date for each member.
23. Retrieve all books along with their issued status (issued or available).
24. Find the number of books issued per month.
25. Find the members who issued more than 5 books.
26. Identify overdue books (assuming a 30-day return policy).
27. Identify books that have been issued but not returned
28. Find books that have been both issued and returned
29. List all distinct books that have been issued or returned
30. Identify overdue books using EXCEPT with date conditions

```sql
-- Total Number of Books in the Library
SELECT COUNT(*) AS total_books FROM books;
--Total books are: 35
```

Results | Messages

total_books
35

```sql
-- Total Number of Members in the Library
SELECT COUNT(*) AS total_members FROM members;
-- There are total 12 Members
```

Results | Messages

	total_members
1	12

```sql
-- Total Number of Employees in the Library
SELECT COUNT(*) AS total_employee FROM employees;
-- There are total 11 employee
```

Results | Messages

	total_employee
1	11

```sql
-- Total Number of Branches
SELECT COUNT(*) AS total_branches FROM branch;
-- So there are total 5 branches available
```

Results | Messages

	total_branches
1	5

```sql
-- Books Currently available for rent
SELECT COUNT(*) AS available_books FROM books
WHERE status = 'Yes';
 -- Currently 32 books are available
```

21 %

Results | Messages

	available_books
1	32

```sql
 SELECT TOP 1 book_title, rental_price
FROM books
ORDER BY rental_price DESC;
-- A People History of the united states is the highest rental price book.
```

121 %

Results | Messages

	book_title	rental_price
1	A Peoples History of the United States	9

```sql
-- Total Revenue from Book Rentals
SELECT SUM(rental_price)AS total_revenue FROM books
WHERE status = 'Yes';
-- Total Revenue is $200
```

121 %

Results | Messages

	total_revenue
1	200

```sql
-- Which book has been borrowed the most (based on issue records)?
SELECT TOP 1 issued_book_name, COUNT(*) AS borrow_count
FROM issued_status
GROUP BY issued_book_name
ORDER BY borrow_count DESC;
-- Most issued books is "Aminam Farm"
```

121 %

Results | Messages

	issued_book_name	borrow_count
1	Animal Farm	2

```sql
-- Find which member has issued the most books.
SELECT TOP 1 issued_member_id, COUNT(*) AS borrow_count
FROM issued_status
GROUP BY issued_member_id
ORDER BY borrow_count DESC;
-- Lvy Martinez | C109
```

121 %

Results | Messages

	issued_member_id	borrow_count
1	C109	7

```sql
-- Which branch has the most issued books? or Most Active Branch
SELECT TOP 1 br.branch_id, COUNT(i.issued_id) AS total_issues
FROM issued_status i
JOIN books b ON i.issued_book_isbn = b.isbn
JOIN employees e ON i.issued_emp_id = e.emp_id
JOIN branch br ON e.branch_id = br.branch_id
GROUP BY br.branch_id
ORDER BY total_issues DESC;
-- So Branch ID B001 is the branch with the most issued books: 17
```

121 %

Results | Messages

	branch_id	total_issues
1	B001	17

```sql
-- Which employee has issued the most books?
SELECT TOP 1 e.emp_name, COUNT(s.issued_id) AS total_issues
FROM issued_status s
JOIN employees e ON s.issued_emp_id = e.emp_id
GROUP BY e.emp_name
ORDER BY total_issues DESC;
-- Laura Martinez is the employee to issue the most books
```

121 %

Results | Messages

	emp_name	total_issues
1	Laura Martinez	6

```sql
-- Find the number of books issued between two specific dates.
SELECT COUNT(*) AS total_books_issued FROM issued_status
WHERE issued_date BETWEEN '2024-03-18' AND '2024-04-12';
-- 26 books issued
```

121 %

Results | Messages

	total_books_issued
1	26

```sql
-- Find the total number of books in each category.
SELECT category, COUNT(*) AS total_books FROM books
GROUP BY category;
```

121 %

Results | Messages

	category	total_books
1	Children	2
2	Classic	8
3	Dystopian	6
4	Fantasy	3
5	Fiction	3
6	History	7
7	Horror	2
8	Literary Fiction	1
9	Mystery	2
10	Science Fiction	1

```sql
-- List employees working in each branch along with their positions.
SELECT e.emp_name, b.branch_id, e.position FROM employees e
JOIN branch b
ON e.branch_id = b.branch_id;
```

column branch_id(nvarchar, not null)

121 %

Results | Messages

	emp_name	branch_id	position
1	John Doe	B001	Clerk
2	Jane Smith	B002	Clerk
3	Mike Johnson	B001	Librarian
4	Emily Davis	B001	Assistant
5	Sarah Brown	B001	Assistant
6	Michelle Ramirez	B001	Assistant
7	Michael Thompson	B005	Clerk
8	Jessica Taylor	B004	Clerk
9	Daniel Anderson	B003	Manager
10	Laura Martinez	B005	Manager
11	Christopher Lee	B005	Assistant

```sql
--  Calculate the total rental income per book category.
SELECT b.category, SUM(b.rental_price) AS total_rental_income
FROM books b
JOIN issued_status i ON b.isbn = i.issued_book_isbn
GROUP BY b.category;
```

121 %

Results | Messages

	category	total_rental_income
1	Children	7.5
2	Classic	59
3	Dystopian	25.5
4	Fantasy	28.5
5	Fiction	14.5
6	History	49.5
7	Horror	13
8	Literary Fiction	6.5
9	Mystery	7.5
10	Science Fiction	8.5

```sql
-- Identify the top 3 highest-paid employees.
SELECT TOP 3 emp_name, salary FROM employees
ORDER BY salary DESC;
```

121 %

Results | Messages

	emp_name	salary
1	Christopher Lee	65000
2	Michael Thompson	62000
3	John Doe	60000

```sql
-- Or We Can Use CTE and Window function

WITH RankedEmployees AS (
    SELECT emp_name, salary,
           ROW_NUMBER() OVER (ORDER BY salary DESC) AS row_num
    FROM employees
)
SELECT emp_name, salary
FROM RankedEmployees
WHERE row_num <= 3;
```

121 %

Results | Messages

	emp_name	salary
1	Christopher Lee	65000
2	Michael Thompson	62000
3	John Doe	60000

```sql
-- Find members who have not issued any books.
SELECT m.member_name AS members FROM members m
JOIN issued_status i
ON m.member_id = i.issued_member_id
WHERE i.issued_member_id IS NULL;
-- Means all the members have issued at least one book
```

121 %

Results | Messages

members

```sql
-- List books that have never been issued.
SELECT book_title
FROM books
WHERE isbn NOT IN (SELECT issued_book_isbn FROM issued_status);
```

121 %

Results | Messages

	book_title
1	The Road
2	1984
3	The Da Vinci Code

```sql
-- Calculate the average rental price of books per publisher.
SELECT publisher, AVG(rental_price) AS avg_rental_price
FROM books
GROUP BY publisher;
```

121 %

Results Messages

	publisher	avg_rental_price
1	Ace	8.5
2	Ballantine Books	5.5
3	Bantam	7
4	Doubleday	7.125
5	Harper & Row	4
6	Harper Perennial	7.83333333333333
7	HarperCollins	3.5
8	HarperOne	2.5
9	Houghton Mifflin Harcourt	7
10	J.B. Lippincott & Co.	5
11	Knopf	6.75
12	Little, Brown and Company	7
13	Oxford University Press	7
14	Penguin Books	6
15	Penguin Classics	4.83333333333333
16	Riverhead Books	5.5
17	Scholastic	7
18	Scribner	8
19	Vintage	7
20	Vintage Books	6.5
21	W. W. Norton & Company	7

```sql
-- Find the number of books issued by each employee.
SELECT e.emp_name, COUNT(i.issued_id) AS total_books_issued
FROM employees e
JOIN issued_status i ON e.emp_id = i.issued_emp_id
GROUP BY e.emp_name;
```

121 %

Results Messages

	emp_name	total_books_issued
1	Daniel Anderson	3
2	Emily Davis	4
3	Jane Smith	2
4	Jessica Taylor	4
5	John Doe	2
6	Laura Martinez	6
7	Michael Thompson	3
8	Michelle Ramirez	6
9	Mike Johnson	1
10	Sarah Brown	4

```sql
-- Find the latest return date for each member.
SELECT r.issued_id, MAX(r.return_date) AS last_return_date
FROM return_status r
GROUP BY r.issued_id;
```

121 %

Results Messages

	issued_id	last_return_date
1	IS101	2023-06-06
2	IS103	2023-08-07
3	IS105	2023-06-07
4	IS106	2024-05-01
5	IS107	2024-05-03
6	IS108	2024-05-05
7	IS109	2024-05-07
8	IS110	2024-05-09
9	IS111	2024-05-11
10	IS112	2024-05-13
11	IS113	2024-05-15
12	IS114	2024-05-17
13	IS115	2024-05-19
14	IS116	2024-05-21
15	IS117	2024-05-23
16	IS118	2024-05-25
17	IS119	2024-05-27
18	IS120	2024-05-29

```sql
-- Retrieve all books along with their issued status (issued or available).
SELECT b.book_title,
       CASE
           WHEN i.issued_book_isbn IS NOT NULL THEN 'Issued'
           ELSE 'Available'
       END AS book_status
FROM books b
LEFT JOIN issued_status i ON b.isbn = i.issued_book_isbn;
```

121 %

Results Messages

	book_title	book_status
1	Where the Wild Things Are	Issued
2	To Kill a Mockingbird	Issued
3	The Kite Runner	Issued
4	Charlotte's Web	Issued
5	A Game of Thrones	Issued
6	A Tale of Two Cities	Issued
7	The Histories	Issued
8	One Hundred Years of Solitude	Issued
9	Pride and Prejudice	Issued
10	Jane Eyre	Issued
11	The Guns of August	Issued
12	The Alchemist	Issued
13	Sapiens: A Brief History of Humankind	Issued
14	Animal Farm	Issued
15	Animal Farm	Issued
16	Dune	Issued
17	The Diary of a Young Girl	Issued
18	The Road	Available
19	The Shining	Issued
20	A Peoples History of the United States	Issued
21	Guns, Germs, and Steel: The Fates of Human Soci...	Issued
22	Fahrenheit 451	Issued
23	Moby Dick	Issued

```sql
-- Find the number of books issued per month.
SELECT MONTH(issued_date) AS month, COUNT(*) AS books_issued
FROM issued_status
GROUP BY MONTH(issued_date)
ORDER BY month;
```

121 %

Results | Messages

	month	books_issued
1	3	22
2	4	13

```sql
-- Find the members who issued more than 5 books.

SELECT issued_member_id, COUNT(*) AS total_books_issued
FROM issued_status
GROUP BY issued_member_id
HAVING COUNT(*) > 5;
```

121 %

Results | Messages

	issued_member_id	total_books_issued
1	C107	6
2	C109	7
3	C110	6

```sql
-- Identify overdue books (assuming a 30-day return policy).
SELECT i.issued_book_name, m.member_name, i.issued_date, r.return_date
FROM issued_status i
JOIN members m ON i.issued_member_id = m.member_id
LEFT JOIN return_status r ON i.issued_id = r.issued_id
WHERE DATEDIFF(DAY, i.issued_date, COALESCE(r.return_date, GETDATE())) > 30;
```

121 %

Results | Messages

	issued_book_name	member_name	issued_date	return_date
3	The Great Gatsby	Henry Anderson	2024-03-12	2024-05-05
4	Jane Eyre	Ivy Martinez	2024-03-13	2024-05-07
5	The Alchemist	Jack Wilson	2024-03-14	2024-05-09
6	Harry Potter and the Sorcerers Stone	Ivy Martinez	2024-03-15	2024-05-11
7	A Game of Thrones	Ivy Martinez	2024-03-16	2024-05-13
8	A Peoples History of the United States	Ivy Martinez	2024-03-17	2024-05-15
9	The Guns of August	Ivy Martinez	2024-03-18	2024-05-17
10	The Histories	Ivy Martinez	2024-03-19	2024-05-19
11	Guns, Germs, and Steel: The Fates of Human Soci...	Jack Wilson	2024-03-20	2024-05-21
12	1984	Jack Wilson	2024-03-21	2024-05-23
13	Pride and Prejudice	Alice Johnson	2024-03-22	2024-05-25
14	Brave New World	Jack Wilson	2024-03-23	2024-05-27
15	The Road	Jack Wilson	2024-03-24	2024-05-29
16	The Shining	Bob Smith	2024-03-25	NULL
17	Fahrenheit 451	Bob Smith	2024-03-26	NULL
18	Dune	Carol Davis	2024-03-27	NULL
19	Where the Wild Things Are	Dave Wilson	2024-03-28	NULL
20	The Kite Runner	Eve Brown	2024-03-29	NULL
21	Charlotte's Web	Eve Brown	2024-03-30	NULL
22	Beloved	Eve Brown	2024-03-31	NULL
23	A Tale of Two Cities	Eve Brown	2024-04-01	NULL
24	The Stand	Eve Brown	2024-04-02	NULL
25	Moby Dick	Frank Thomas	2024-04-03	NULL
26	To Kill a Mockingbird	Frank Thomas	2024-04-04	NULL
27	The Hobbit	Frank Thomas	2024-04-05	NULL
28	Angels & Demons	Grace Taylor	2024-04-06	NULL

```sql
-- Identify books that have been issued but not returned
SELECT issued_book_isbn
FROM issued_status

EXCEPT

SELECT return_book_isbn
FROM return_status;
-- Use of SET OPERATORS
```

121 %

Results | Messages

	issued_book_isbn
1	978-0-06-025492-6
2	978-0-06-112008-4
3	978-0-06-112241-5
4	978-0-06-440055-8
5	978-0-09-957807-9
6	978-0-14-027526-3
7	978-0-14-044930-3
8	978-0-14-118776-1
9	978-0-14-143951-8
10	978-0-141-44171-6
11	978-0-19-280551-1

```sql
-- Find books that have been both issued and returned
SELECT issued_book_isbn
FROM issued_status

INTERSECT

SELECT return_book_isbn
FROM return_status;
```

121 %

Results | Messages

issued_book_isbn

```sql
-- List all distinct books that have been issued or returned
SELECT issued_book_isbn
FROM issued_status

UNION

SELECT return_book_isbn
FROM return_status;
```

121 %

Results | Messages

	issued_book_isbn
1	978-0-06-025492-6
2	978-0-06-112008-4
3	978-0-06-112241-5
4	978-0-06-440055-8
5	978-0-09-957807-9
6	978-0-14-027526-3

```sql
-- Identify overdue books using EXCEPT with date conditions
SELECT issued_book_isbn
FROM issued_status
WHERE DATEDIFF(DAY, issued_date, GETDATE()) > 30

EXCEPT

SELECT return_book_isbn
FROM return_status;
```

121 %

Results | Messages

	issued_book_isbn
1	978-0-06-025492-6
2	978-0-06-112008-4
3	978-0-06-112241-5
4	978-0-06-440055-8