Loan Management System

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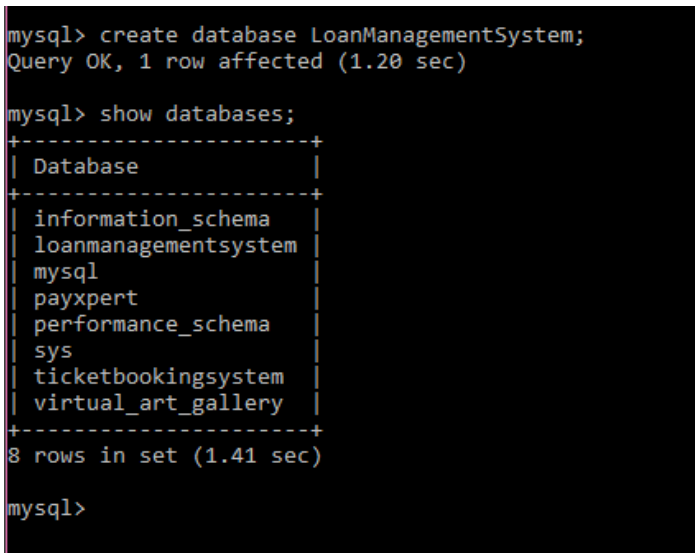
Github Link: https://github.com/samikshapatil07/Loan_Management_System

Working with Database:

-- Create the Database

create database LoanManagementSystem;

show databases;

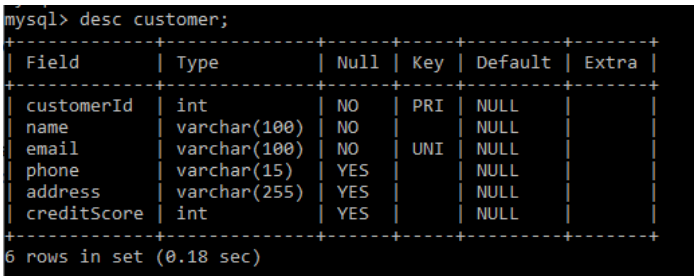


Created tables for:

1. `Customer`
2. `Loan` (base table for both HomeLoan and CarLoan)
3. `HomeLoan` (with foreign key to `Loan`)
4. `CarLoan` (with foreign key to `Loan`)

Create Customer Table

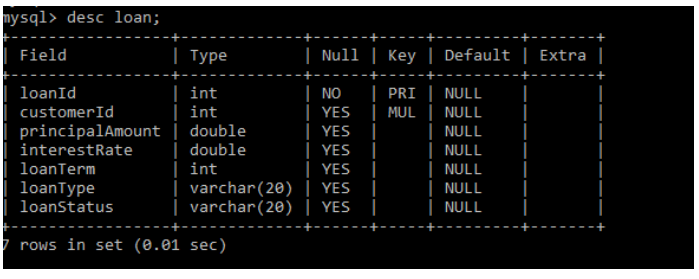
```
CREATE TABLE Customer (
customerId INT PRIMARY KEY,
name VARCHAR(100) NOT NULL,
email VARCHAR(100) UNIQUE NOT NULL,
phone VARCHAR(15),
address VARCHAR(255),
creditScore INT
);
```



```
mysql> desc customer;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| customerId  | int          | NO   | PRI | NULL    |       |
| name        | varchar(100) | NO   |     | NULL    |       |
| email       | varchar(100) | NO   | UNI | NULL    |       |
| phone       | varchar(15)  | YES  |     | NULL    |       |
| address     | varchar(255) | YES  |     | NULL    |       |
| creditScore | int          | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
6 rows in set (0.18 sec)
```

Create Loan Table

```
CREATE TABLE Loan (
loanId INT PRIMARY KEY,
customerId INT,
principalAmount DOUBLE,
interestRate DOUBLE,
loanTerm INT,
loanType VARCHAR(20),
loanStatus VARCHAR(20),
FOREIGN KEY (customerId) REFERENCES Customer(customerId)
);
```



```
mysql> desc loan;
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| loanId          | int         | NO   | PRI | NULL    |       |
| customerId      | int         | YES  | MUL | NULL    |       |
| principalAmount | double      | YES  |     | NULL    |       |
| interestRate    | double      | YES  |     | NULL    |       |
| loanTerm        | int         | YES  |     | NULL    |       |
| loanType        | varchar(20) | YES  |     | NULL    |       |
| loanStatus      | varchar(20) | YES  |     | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
7 rows in set (0.01 sec)
```

Create HomeLoan Table

```
CREATE TABLE HomeLoan (
loanId INT PRIMARY KEY,
```

propertyAddress VARCHAR(255),
propertyValue INT,
FOREIGN KEY (loanId) REFERENCES Loan(loanId)
);

```
mysql> desc HomeLoan;
+-----------------+--------------+------+-----+---------+-------+
| Field           | Type         | Null | Key | Default | Extra |
+-----------------+--------------+------+-----+---------+-------+
| loanId          | int          | NO   | PRI | NULL    |       |
| propertyAddress | varchar(255) | YES  |     | NULL    |       |
| propertyValue   | int          | YES  |     | NULL    |       |
+-----------------+--------------+------+-----+---------+-------+
3 rows in set (0.01 sec)
```

Create CarLoan Table

CREATE TABLE CarLoan (
loanId INT PRIMARY KEY,
carModel VARCHAR(100),
carValue INT,
FOREIGN KEY (loanId) REFERENCES Loan(loanId)
);

```
mysql> desc CarLoan;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| loanId   | int          | NO   | PRI | NULL    |       |
| carModel | varchar(100) | YES  |     | NULL    |       |
| carValue | int          | YES  |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
3 rows in set (0.11 sec)
```

Inserted data into tables as shown below;

Customer table:

INSERT INTO Customer (customerId, name, email, phone, address, creditScore)
VALUES
(1, 'Samiksha', 'samiksha@example.com', '9876543210', '123 Ram nagar, Delhi', 720),
(2, 'Sandeep', 'sandeep@example.com', '9123456780', '456 Kolhapur, MH', 640),
(3, 'Madhu', 'madhu@example.com', '9988776655', '789 Pine Road, TN', 680);

```
mysql> select * from customer;
+------------+---------+--------------------+------------+--------------------+-------------+
| customerId | name    | email              | phone      | address            | creditScore |
+------------+---------+--------------------+------------+--------------------+-------------+
|          1 | Samiksha | samiksha@example.com | 9876543210 | 123 Ram nagar, Delhi |         720 |
|          2 | Sandeep  | sandeep@example.com  | 9123456780 | 456 Kolhapur, MH     |         640 |
|          3 | Madhu    | madhu@example.com    | 9988776655 | 789 Pine Road, TN    |         680 |
+------------+---------+--------------------+------------+--------------------+-------------+
3 rows in set (0.10 sec)
```

Loan table:

INSERT INTO Loan (loanId, customerId, principalAmount, interestRate, loanTerm, loanType, loanStatus) VALUES
(101, 1, 500000, 7.5, 60, 'HomeLoan', 'Pending'),
(102, 2, 300000, 8.0, 36, 'CarLoan', 'Pending'),
(103, 3, 600000, 6.8, 84, 'HomeLoan', 'Pending');

```
mysql> select * from Loan;
+--------+------------+-----------------+--------------+----------+----------+------------+
| loanId | customerId | principalAmount | interestRate | loanTerm | loanType | loanStatus |
+--------+------------+-----------------+--------------+----------+----------+------------+
|    101 |          1 |          500000 |          7.5 |       60 | HomeLoan | Pending    |
|    102 |          2 |          300000 |            8 |       36 | CarLoan  | Pending    |
|    103 |          3 |          600000 |          6.8 |       84 | HomeLoan | Pending    |
+--------+------------+-----------------+--------------+----------+----------+------------+
3 rows in set (0.00 sec)
```

HomeLoan table:

INSERT INTO HomeLoan (loanId, propertyAddress, propertyValue) VALUES
(101, '12 Shivaji Nagar, Delhi', 700000),
(103, '77 Anna Salai, TN', 800000);

```
mysql> select * from HomeLoan;
+--------+-------------------------+---------------+
| loanId | propertyAddress         | propertyValue |
+--------+-------------------------+---------------+
|    101 | 12 Shivaji Nagar, Delhi |        700000 |
|    103 | 77 Anna Salai, TN       |        800000 |
+--------+-------------------------+---------------+
2 rows in set (0.00 sec)
```

CarLone table:

INSERT INTO CarLoan (loanId, carModel, carValue) VALUES
(102, 'Hyundai Creta 2023', 350000);

```
mysql> select * from CarLoan;
+--------+--------------------+----------+
| loanId | carModel           | carValue |
+--------+--------------------+----------+
|    102 | Hyundai Creta 2023 |   350000 |
+--------+--------------------+----------+
1 row in set (0.00 sec)
```

Working with Java

Step 1: Create Packages

```
src/
│
├── entity          → For data models (Customer, Loan, etc.)
├── dao             → For interface and its implementation
├── exception       → For custom exceptions
├── util            → For DB utilities
└── main            → For main class with menu
```

Step 2: Working in Entity Package

1. Create `Customer` Class:

- Customers : Stores basic customer info like name, phone, email, credit score.

2. Create `Loan` Class:

- Loan : Base class with details like loan ID, amount, interest rate, and type.
- Acts as a **base class** for all types of loans.

3. Create `HomeLoan` Class:

- Home : Special loan with property details (address, value).
- Extends `Loan`

4. Create `CarLoan` Class:

- Car : Special loan with car model and value.
- Extends `Loan`

Step 3: Working in dao Package

1. Create Interface `ILoanRepository`

- Declare methods like:

`applyLoan(), calculateInterest(), calculateEMI(), loanStatus(), loanRepayment(), getLoanById(), getAllLoan()`

2. Implement in `ILoanRepositoryImpl` :

- Contains **all logic to interact with database** using JDBC.
- Separate logic based on `HomeLoan` or `CarLoan` using `instanceof`.
- Exception handling using `InvalidLoanException`.
- Calls SQL queries to insert, retrieve, update, or validate loan data.

Step 4: Working in `exception` Package

1. Create `InvalidLoanException` Class:

- Extends `Exception`
- Used when a loan ID is not found
- Helps handle errors more cleanly in the app

Step 5: Working in `util` Package

1. Create `DBPropertyUtil` :

- Reads database configuration from `db.properties` file

2. Create `DBConnUtil` :

- Uses `DBPropertyUtil` to create and return a `Connection` object

Step 7: Create `LoanManagement.java`

1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit

Output:

1. Apply Loan:

a. Home Loan:

```
=== Welcome to Loan Management System ===

==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 1
Enter Loan Type (H for HomeLoan, C for CarLoan):
H
Loan ID:
106
Customer ID:
5
Principal Amount:
3000000
Interest Rate:
10
Loan Term (months):
100
Property Address:
Property Road,Delhi
Property Value:
5000000
Loan applied successfully and is in Pending status.
```

b. CarLoan:

```
==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 1
Enter Loan Type (H for HomeLoan, C for CarLoan):
C
Loan ID:
107
Customer ID:
5
Principal Amount:
100000
Interest Rate:
9
Loan Term (months):
80
Car Model:
Verna
Car Value:
100000
Loan applied successfully and is in Pending status.
```

2.View All Loans

```
==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 2
Loan ID: 101, Customer: [Customer ID: 1, Name: Samiksha, Email: samiksha@example.com, Phone: 9876543210, Address: 123 Ram nagar, Delhi, Credit Score: 720], Principal: 500
Loan ID: 102, Customer: [Customer ID: 2, Name: Sandeep, Email: sandeep@example.com, Phone: 9123456780, Address: 456 Kolhapur, MH, Credit Score: 640], Principal: 300000.0,
Loan ID: 103, Customer: [Customer ID: 3, Name: Madhu, Email: madhu@example.com, Phone: 9988776655, Address: 789 Pine Road, TN, Credit Score: 680], Principal: 600000.0, In
Loan ID: 104, Customer: [Customer ID: 4, Name: Amit, Email: amit@example.com, Phone: 9876540000, Address: 101 MG Road, Pune, Credit Score: 700], Principal: 1000000.0, Int
Loan ID: 105, Customer: [Customer ID: 4, Name: Amit, Email: amit@example.com, Phone: 9876540000, Address: 101 MG Road, Pune, Credit Score: 700], Principal: 1000000.0, Int
Loan ID: 106, Customer: [Customer ID: 5, Name: Anuj, Email: anuj@example.com, Phone: 9876540000, Address: 18 Gandhi Road, Banglore, Credit Score: 800], Principal: 3000000
Loan ID: 107, Customer: [Customer ID: 5, Name: Anuj, Email: anuj@example.com, Phone: 9876540000, Address: 18 Gandhi Road, Banglore, Credit Score: 800], Principal: 100000.
```

3.Get Loan by ID

```
=== Welcome to Loan Management System ===

==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 3
Enter Loan ID:
107
Loan ID: 107, Customer: [Customer ID: 5, Name: Anuj, Email: anuj@example.com, Phone: 9876540000, Address: 18 Gandhi Road, Banglore, Credit Score:
```

4.Calculate Interest

```
=== Welcome to Loan Management System ===

==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 4
Enter Loan ID:
107
Calculated Interest for Loan ID 107: 60000.0
```

5.Check Loan Status

```
==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 5
Enter Loan ID:
107
Loan ID 107 is now Approved
```

6.Repay Loan

```
==== MENU ====
1. Apply Loan
2. View All Loans
3. Get Loan by ID
4. Calculate Interest
5. Check Loan Status
6. Repay Loan
7. Exit
Enter your choice: 6
Enter Loan ID:
107
Enter Repayment Amount:
100000
Repayment successful. You have paid 59 EMI(s).
```