5. Bank Transactions

Functionalities to Cover:

1. 2 Roles – Customer, Manager.

2. Manage (Add, Edit, Remove) Customer.

3. Internal Bank Transactions between Customers.

4. Monthly Statements in the form of PDF.

5. List the Customers added for the given time.

6. Calculate Interest based on flag – some accounts need to calculate some should not.

7. Add / Modify / Remove Nominee.

8. Add, hotlist debit card / credit card.

9. Send alert (mail) if the PAN or Aadhar Details are not updated.

10. Show last logged in details.

The SQL Tables used for the Bank Transaction Task:

i) Users

```
        CREATE TABLE Users (

    user_id INT PRIMARY KEY AUTO_INCREMENT,

    username VARCHAR(50) NOT NULL,

    password VARCHAR(50) NOT NULL,

    role ENUM('Customer', 'Manager') NOT NULL,

    last_logged_in DATETIME

   ) AUTO_INCREMENT = 10000;
```

ii) Customers

```sql
CREATE TABLE Customers (

    customer_id INT AUTO_INCREMENT PRIMARY KEY,

    user_id INT UNIQUE,

    full_name VARCHAR(100) NOT NULL,

    email VARCHAR(100),

    phone_number VARCHAR(20),

    address VARCHAR(255),

    adhar_number VARCHAR(12),

    pan_number VARCHAR(10),

    balance DECIMAL(10,2),

    LoginTime DATETIME,

    calculate_interest BOOLEAN DEFAULT TRUE,

    FOREIGN KEY (user_id) REFERENCES Users(user_id)
) AUTO_INCREMENT = 50000;
```

iii) Transactions

```sql
CREATE TABLE Transactions (

    customer_id INT,

    description VARCHAR(255),

    amount DECIMAL(10,2),

    balance DECIMAL(10,2),

    transaction_time DATETIME,

    FOREIGN KEY (customer_id) REFERENCES Customers(customer_id)
);
```
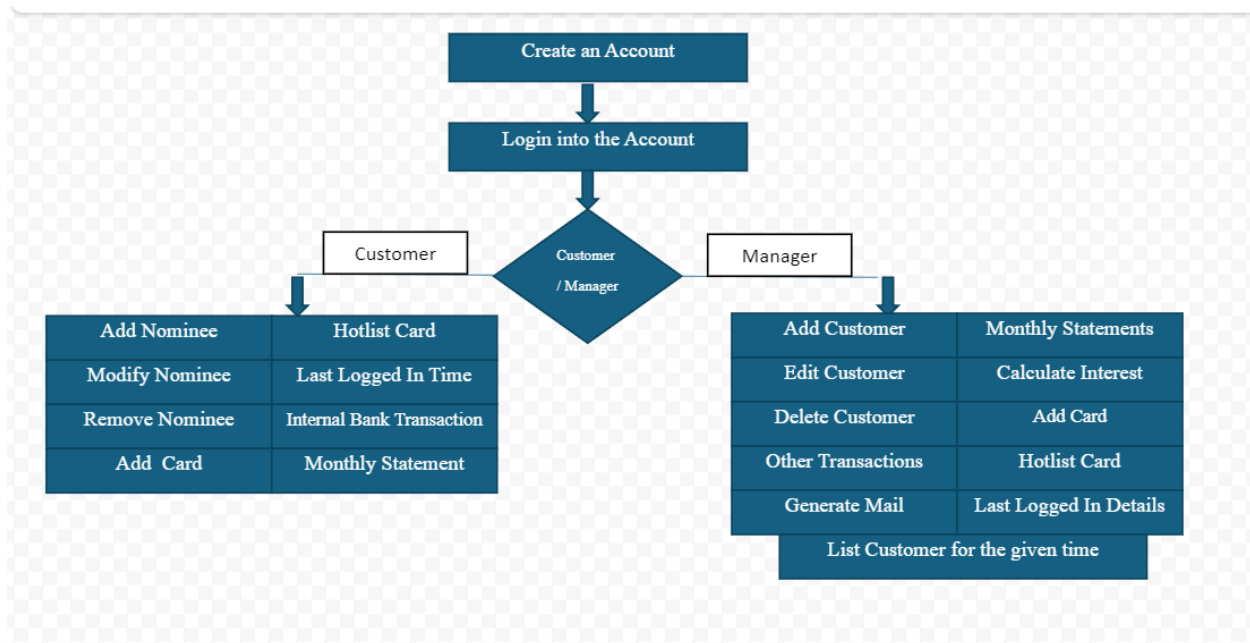
iv) Nominee

```
CREATE TABLE Nominee (

  nominee_id INT AUTO_INCREMENT PRIMARY KEY,

  customer_id INT,

  nominee_name VARCHAR(100) NOT NULL,

  relationship VARCHAR(100),

  contact_no VARCHAR(20),

  FOREIGN KEY (customer_id) REFERENCES Customers(customer_id)

) AUTO_INCREMENT = 90000;
```

  v) Cards

```
CREATE TABLE Cards (

  card_id INT AUTO_INCREMENT PRIMARY KEY,

  card_number VARCHAR(16) UNIQUE NOT NULL,

  card_type ENUM('debit', 'credit') NOT NULL,

  status ENUM('active', 'hotlisted') DEFAULT 'active',

  expiration_date DATE,

  customer_id INT,

  FOREIGN KEY (customer_id) REFERENCES Customers(customer_id)

) AUTO_INCREMENT = 3000;
```
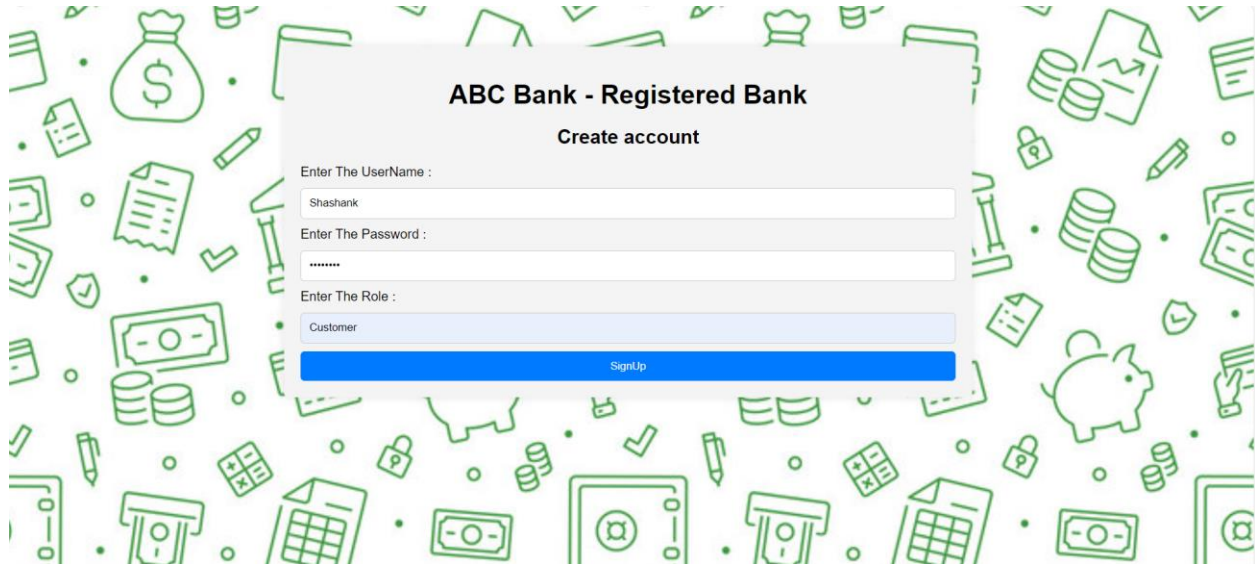
Workflow:

```
                           ┌─────────────────────┐
                           │  Create an Account  │
                           └─────────────────────┘
                                     │
                                     ▼
                           ┌─────────────────────┐
                           │ Login into the Account│
                           └─────────────────────┘
                                     │
                  ┌──────────┐       ◆ Customer      ┌──────────┐
                  │ Customer │       / Manager        │ Manager  │
                  └──────────┘                        └──────────┘
```

Add Nominee	Hotlist Card
Modify Nominee	Last Logged In Time
Remove Nominee	Internal Bank Transaction
Add Card	Monthly Statement

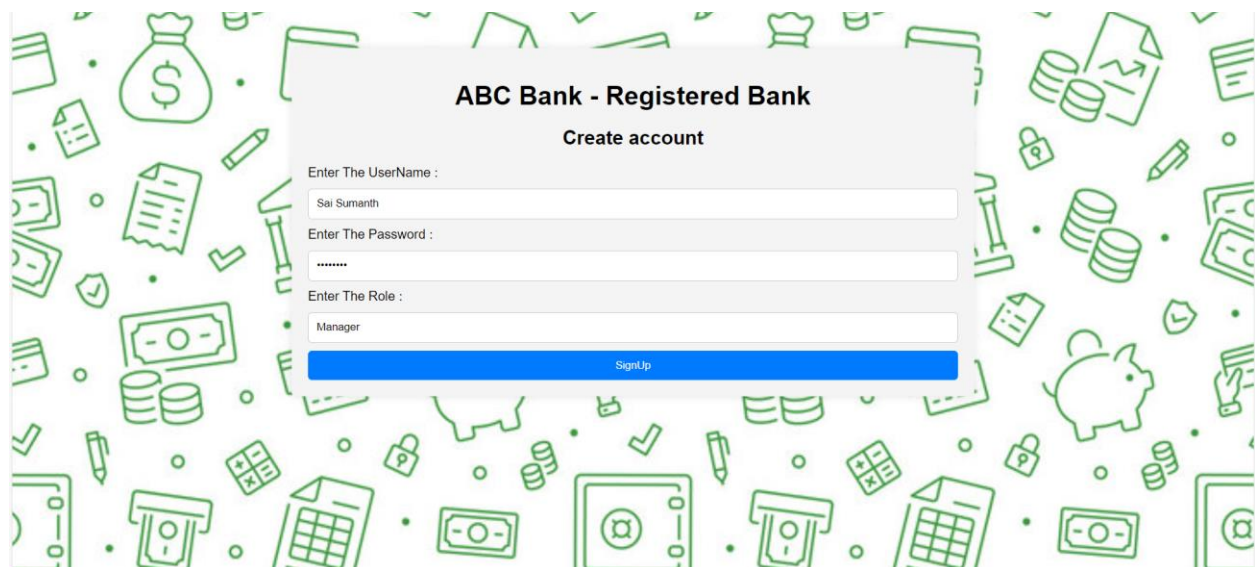| Add Customer	Monthly Statements
Edit Customer	Calculate Interest
Delete Customer	Add Card
Other Transactions	Hotlist Card
Generate Mail	Last Logged In Details
List Customer for the given time	

Procedure:

The main thing is the Customer and Manager must create their accounts before login. These details will be stored in the Users Table.

Creation Of the Customer Account: (CreateAccount.jsp)

Creation Of the Manager Account: (CreateAccount.jsp)

The role must be either a 'Customer' or 'Manager'.

There is a validation for the Password. It should have the

I) Atleast One Upper Case letter.
II) Atleast One Lower Case letter.
III)   Atleast One Special Character.
IV)   Atleast One Numeric.

Login Of the Customer or Manager: (loginAccount.jsp)
If the role corresponding to the 'user_id' is 'Customer' then it will redirect to the page where customer can manage the operations. Else it will redirect to the page where the manager can manage the operations.

For the Customer:
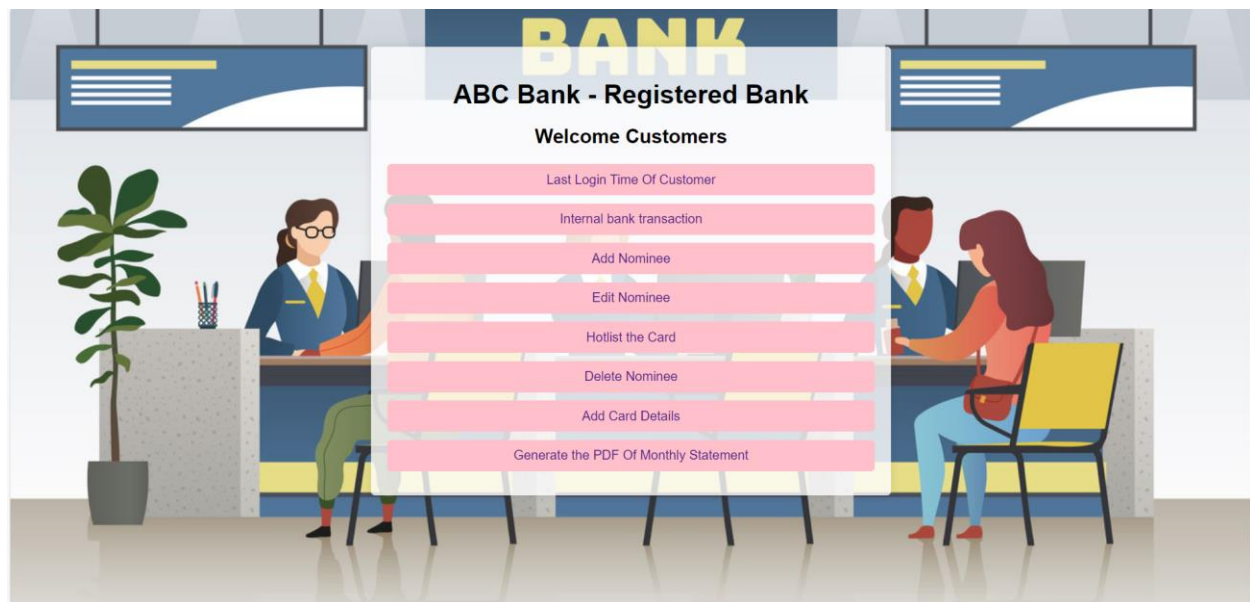
For the Manager:
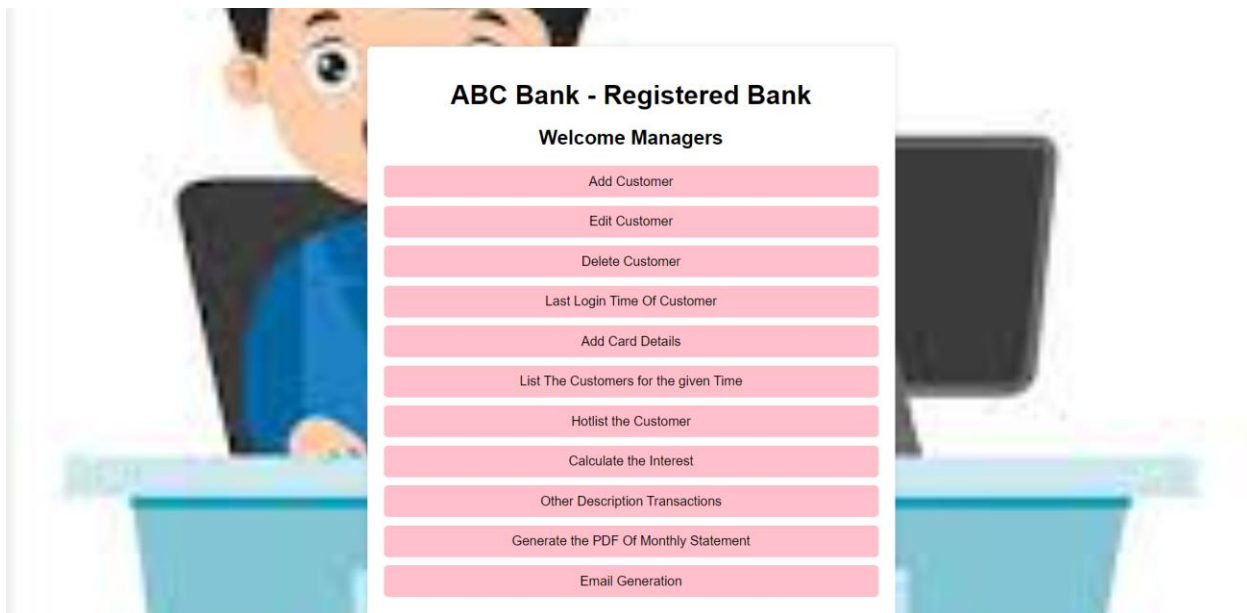
2. Manage (Add, Edit, Remove) Customer
In the 'Customers' Table I have made 'user_id' as Foreign Key referencing from the 'Users' Table. The field values will be added to the 'Customers' table if and only if the 'user_id' exists. If not, it will throw the error.

Adding the Customer (add_customer.jsp)

The case where the 'user_id' is exists in the 'Users' Table.

ABC Bank - Registered Bank

Add Customer

Enter The UserId :

10016

Enter The Full Name :

Shashank S

Enter The Email :

shash54@gmail.com

Enter The Phone number :

9076543270

Enter The Address :

Tirupathi, AP

Enter The Aadhar number :

759367497620

Enter The Pan number :

FIZGD1674E

Enter The Money to add :

16000

Calculate Interest:

☑

Create

The case where 'user_id' does not exist in the 'Users' Table.

Enter The UserId :

10025

Enter The Full Name :

Shashank S

Enter The Email :

shash54@gmail.com

Enter The Phone number :

9076543270

Enter The Address :

Tirupathi, AP

Enter The Aadhar number :

759367497620

Enter The Pan number :

FIZGD1674E

Enter The Money to add :

16000

Calculate Interest:

☑

Create

Console OP:

java.sql.SQLIntegrityConstraintViolationException: Cannot add or update a
child row: a foreign key constraint fails (`task`.`customers`, CONSTRAINT
`customers_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `users` (`user_id`))

5 1 0 0 0 1 1 1 6	0 0 1	Shas hank S	shash54@g mail.com	90765 43270	Tirupat hi, AP	759367 497620	FIZGD 1674E	160 00. 00	2024-03-19 17:48:28	1

Edit the Customer (editCustomer.jsp)

ABC Bank - Registered Bank

Edit Customer Account

Enter The Customer Id :   50011

Enter The Email :   shaknk90@gmail.com

Enter The Phone number :   7376543270

[Edit]

5001011	1000016	Shashank S	shaknk90@gmail.com	7376543270	Tirupathi, AP	759367497620	FIZGD1674E	16000.00	2024-03-19 17:56:00	1

Delete the Customer (deleteCustomer.jsp)

Before Deletion:

customer_id	user_id	full_name	email	phone_number	address	adhar_number	pan_number	balance	LoginTime	calculate_interest
50000	10000	ShanmukhNalla	shan@23gmail.com	8761927452	Chennai, TamilNadu	679367495120	HKHAL7489U	10000.00	2024-03-15 10:40:25	1
50001	10001	Balaji M	balaji.56@gmail.com	9876543210	Kota, Rajasthan	123456789012	ABZCD1234E	12000.00	2024-03-15 10:43:49	1
50002	10004	Chinmayaa	chinmay@gmail.com	1234567890	Kurnool, AP	987654321098	XYZAB5678F	6000.00	2024-03-15 10:47:19	0
50003	10005	Goutham Babu	gowtham@002gmail.com	9876543750	Hyderabad, TS	456789012345		18000.00	2024-03-19 14:12:14	1
50004	10006	Padmanabhan G	pad59@gmail.com	2345678901	Banglore, Karnataka		MNPQR9012G	10000.00	2024-03-15 10:50:59	0
50005	10008	Param K	param50@gmail.com	3456789012	Mumbai, Maharashtra	890123456789	STUVW3456H	16000.00	2024-03-15 10:53:11	1
50006	10007	Nishanth S	nishant89@gmail.com	9876543267	Chennai, TN	567890123456		12000.00	2024-03-19 14:14:03	0
50008	10012	Jythoish B	Jyo.26@gmail.com	987654390	Pakala, AP	123456735021	KBZGD1234E	14000.00	2024-03-18 10:11:28	1
50009	10013	Chaitanya T	chaitan.87@gmail.com	9875443750	Nellore, AP	989367495120	CUZGD1674E	9000.00	2024-03-18 11:11:06	0
50010	10014	Manikanta G	mani89@gmail.com	8576543270	Vijayawada, AP	989367497620	FLHAL7459U	15000.00	2024-03-19 14:31:16	1
50011	10016	Shashank S	shaknk90@gmail.com	7376543270	Tirupathi, AP	759367497620	FIZGD1674E	16000.00	2024-03-19 17:56:00	1

ABC Bank - Registered Bank

Delete Customer Account

Enter The Customer ID : 50000

[Delete]

After Deletion:

customer_id	user_id	full_name	email	phone_number	address	adhar_number	pan_number	balance	LoginTime	calculate_interest
50001	10001	Balaji M	balaji.56@gmail.com	9876543210	Kota, Rajasthan	123456789012	ABZCD1234E	12000.00	2024-03-15 10:43:49	1
50002	10004	Chinmayaa	chinmay@gmail.com	1234567890	Kurnool, AP	987654321098	XYZAB5678F	6000.00	2024-03-15 10:47:19	0
50003	10005	Goutham Babu	gowtham@002gmail.com	9876543750	Hyderabad, TS	456789012345		18000.00	2024-03-19 14:12:14	1
50004	10006	Padmanabhan G	pad59@gmail.com	2345678901	Banglore, Karnataka		MNPQR9012G	10000.00	2024-03-15 10:50:59	0
50005	10008	Param K	param50@gmail.com	3456789012	Mumbai, Maharashtra	890123456789	STUVW3456H	16000.00	2024-03-15 10:53:11	1
50006	10007	Nishanth S	nishant89@gmail.com	9876543267	Chennai, TN	567890123456		12000.00	2024-03-19 14:14:03	0
50008	10012	Jythoish B	Jyo.26@gmail.com	987654390	Pakala, AP	123456735021	KBZGD1234E	14000.00	2024-03-18 10:11:28	1
50009	10013	Chaitanya T	chaitan.87@gmail.com	9875443750	Nellore, AP	989367495120	CUZGD1674E	9000.00	2024-03-18 11:11:06	0
50010	10014	Manikanta G	mani89@gmail.com	8576543270	Vijayawada, AP	989367497620	FLHAL7459U	15000.00	2024-03-19 14:31:16	1
50011	10016	Shashank S	shaknk90@gmail.com	7376543270	Tirupathi, AP	759367497620	FIZGD1674E	16000.00	2024-03-19 17:56:00	1

3. Internal bank transactions between Customers (InternalBankTransaction.jsp)

Before Transaction:

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		Name	Email	Phone	City		PAN	Amount	Date	
50009	10013	Chaitanya T	chaitan.87@gmail.com	9875443750	Nellore, AP	989367495120	CUZGD1674E	9000.00	2024-03-18 11:11:06	0
500011	100116	Shashank S	shaknk90@gmail.com	7376543270	Tirupathi, AP	759367497620	FIZGD1674E	16000.00	2024-03-19 17:56:00	1

ABC Bank - Registered Bank

Create account

Enter The Customer ID 1 : 50011

Enter The Customer ID 2 : 50009

Enter The Amount to be transferred : 3700

Send

After Transaction:

		Name	Email	Phone	City		PAN	Amount	Date	
50010	100	Chaitanya T	chaitan.87@gmail.com	9875443750	Nellore, AP	989367495120	CUZGD1674E	19700.00	2024-03-19 18:05:39	0

0 9 5 0 0 1 1	1 3 1 0 0 1 6	Shas hank S	shaknk90@g mail.com	73765 43270	Tirup athi, AP	759367 497620	FIZGD1 674E	123 00. 00	2024-03-19 18:05:39	1

4. Monthly statements in the form of PDF

The transactions with the description 'Cheques', 'Unpaid Cheques', 'Other debits' are done in the 'OtherDescriptionTransactions.jsp' added to the 'Transactions' table of 'Task' database.

ABC Bank - Registered Bank

Other Description Transactions

Enter The Customer ID : 50011

Enter The Description : Cheque

Enter The Amount : 2000

Add Money

customer_id	description	amount	balance	transaction_time
50010	Credit	1000.00	14000.00	2024-03-19 14:14:03
50010	Cheque	5000.00	19000.00	2024-03-19 14:27:27
50010	Unpaid Cheques	2500.00	16500.00	2024-03-19 14:27:53
50010	Other Debits	1000.00	15500.00	2024-03-19 14:28:25
50010	Unpaid Cheques	500.00	15000.00	2024-03-19 14:31:16
50011	Debit	3700.00	12300.00	2024-03-19 18:05:39
50009	Credit	3700.00	19700.00	2024-03-19 18:05:39
50004	Debit	2000.00	8000.00	2024-03-19 18:06:54
50011	Credit	2000.00	12000.00	2024-03-19 18:06:54
50008	Debit	1500.00	12500.00	2024-03-19 18:07:12
50011	Credit	1500.00	15500.00	2024-03-19 18:07:12
50011	Cheque	2000.00	17500.00	2024-03-20 10:26:15
50011	Unpaid Cheques	1500.00	16000.00	2024-03-20 10:27:07
50011	Cheque	2000.00	18000.00	2024-03-20 10:27:36
50011	Other Debits	2500.00	15500.00	2024-03-20 10:27:53

Monthly Statements (PDFGeneration.jsp):

ABC Bank - Registered Bank

Monthly Statement in the form of PDF

Enter The Customer ID :   50011

Generate PDF

Monthly statements

ABC Bank - Registered Bank

Customer Name: Shashank S

Customer Address: Tirupathi, AP

Customer Email: shaknk90@gmail.com

Phone Number: 7376543270

Aadhar Number: 759367497620

PAN Number: FIZGD1674E

Last Login Time: 2024-03-20 10:27:53.0

Bank Statement for the period 1 March 2024 to 31 March 2024

Date	Transaction Description	Amount	Balance
2024-03-19 18:05:39	Debit	3700.00	12300.00
2024-03-19 18:06:54	Credit	2000.00	12000.00
2024-03-19 18:07:12	Credit	1500.00	15500.00
2024-03-20 10:26:15	Cheque	2000.00	17500.00
2024-03-20 10:27:07	Unpaid Cheques	1500.00	16000.00
2024-03-20 10:27:36	Cheque	2000.00	18000.00
2024-03-20 10:27:53	Other Debits	2500.00	15500.00

Debit Amount: 3700.0

Credit Amount: 3500.0

Deposit Amount: 7200.0

Cheque Amount: 4000.0

Unpaid Cheque Amount: 1500.0

Service Fee Amount: 45.0

Remaining Balance: 15455.00

Important Notice

Statements are accepted as correct unless queried within 30 days. Any cheques reflected on this statement, which are not attached, will be included with your next statement.

5. List the Customers added for the given time. (ListCustomersTime.jsp)

ABC Bank - Registered Bank

List customers added for the given time

Start Date: `03/19/2024` 📅

End Date: `03/20/2024` 📅

[List Customers]

```
<h2>Customers added between 2024-03-19 and 2024-03-20</h2>
Customer ID: 50003<br>
Name: Goutham Babu<br>
Email: gowtham@002gmail.com<br>
<hr>
Customer ID: 50004<br>
Name: Padmanabhan G<br>
Email: pad59@gmail.com<br>
<hr>
Customer ID: 50006<br>
Name: Nishanth S<br>
Email: nishant89@gmail.com<br>
<hr>
Customer ID: 50008<br>
Name: Jythoish B<br>
Email: Jyo.26@gmail.com<br>
<hr>
Customer ID: 50009<br>
Name: Chaitanya T<br>
Email: chaitan.87@gmail.com<br>
<hr>
Customer ID: 50010<br>
Name: Manikanta G<br>
Email: mani89@gmail.com<br>
<hr>
Customer ID: 50011<br>
Name: Shashank S<br>
Email: shaknk90@gmail.com<br>
<hr>
```

6. Calculate Interest based on flag – some accounts need to calculate some should not. (CalculateInterest.jsp)

If calculate_interest = 1.

ABC Bank - Registered Bank

Calculate Interest

Enter The Customer Id :

50011

Calculate Interest

```
Interest calculated successfully!
Initial Balance: Rs 15500.0
Interest Rate: 5.0
Interest Amount: Rs 775.0
New Balance: Rs 16275.0
```

If calculate_interest = 0.

ABC Bank - Registered Bank

Calculate Interest

Enter The Customer Id :

50009

Calculate Interest

Interest calculation skipped! No interest calculated.!

7. Add/ Modify/ Remove Nominee

Add Nominee (addNomineeDetails.jsp)

ABC Bank - Registered Bank

Add Nominee Details

Enter The Customer Id :

50011

Enter The Nominee Name :

Parosh

Enter The Relationship :

Father

Enter The Contact No :

7054321098

Add Nominee

nominee_id	customer_id	nominee_name	relationship	contact_no
90002	50001	Sandesh K	brother	8765432109
90003	50002	Kishore T	Son	7654321098
90004	50003	Sathwik K	Nephew	6543210952
90005	50004	Priya K	Wife	5432109876
90006	50006	Padmaa S	Sister	5432109876
90007	50010	Nithin V	Brother	5432109832
90009	50006	Chandrudu G	Father	8765432178
90010	50011	Parosh	Father	7054321098

Modify Nominee: (editNomineeDetails.jsp)

ABC Bank - Registered Bank

Edit Nominee Details

Enter The Nominee Id :   90010

Enter The Nominee Name :   Parosh

Enter The Relationship :   Maternal Grandfather

Enter The Contact No :   9043210952

Edit Nominee

nominee_id	customer_id	nominee_name	relationship	contact_no
90002	50001	Sandesh K	brother	8765432109
90003	50002	Kishore T	Son	7654321098
90004	50003	Sathwik K	Nephew	6543210952
90005	50004	Priya K	Wife	5432109876
90006	50006	Padmaa S	Sister	5432109876
90007	50010	Nithin V	Brother	5432109832
90009	50006	Chandrudu G	Father	8765432178
90010	50011	Parosh	Maternal Grandfather	9043210952

Remove Nominee (deleteNomineeDetails.jsp):

ABC Bank - Registered Bank

Delete Nominee Details

Enter The Nominee Id : 90010

[Delete Nominee]

nominee_id	customer_id	nominee_name	relationship	contact_no
90002	50001	Sandesh K	brother	8765432109
90003	50002	Kishore T	Son	7654321098
90004	50003	Sathwik K	Nephew	6543210952
90005	50004	Priya K	Wife	5432109876
90006	50006	Padmaa S	Sister	5432109876
90007	50010	Nithin V	Brother	5432109832
90009	50006	Chandrudu G	Father	8765432178

8. Add, hotlist debit card/ credit card

Add debit card/ credit card (AddCardDetails.jsp)

ABC Bank - Registered Bank

Add Card Details

Enter The Customer Id :

> 50011

Enter The Card Type :

> Debit

Enter The Status :

> Active

Enter The Expiration date :

> 03 / 30 / 2026

Add Card

card_id	card_type	status	expiration_date	customer_id
3000	debit	active	2030-03-27	50002
3001	credit	active	2030-03-27	50003
3002	credit	active	2035-10-22	50004
3003	debit	hotlisted	2032-05-18	50005
3004	debit	hotlisted	2028-05-14	50006
3005	credit	active	2029-05-14	50001
3007	credit	hotlisted	2024-03-08	50008
3008	credit	hotlisted	2024-03-17	50010
3009	debit	active	2026-03-30	50011

Hotlist debit card/ credit card (hotlistCard.jsp):
The card can be hotlist If the reason is 'Stolen' or 'Breach' or 'Fraud' or 'Expiry'.

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For 'Expiry' it will compare with today's date.

Reason - Fraud

ABC Bank - Registered Bank

Hotlist Card

Enter The Card Id : 3009

Enter the Reason : Fraud

Hotlist Card

card_id	card_type	status	expiration_date	customer_id
3000	debit	active	2030-03-27	50002
3001	credit	active	2030-03-27	50003
3002	credit	active	2035-10-22	50004
3003	debit	hotlisted	2032-05-18	50005
3004	debit	hotlisted	2028-05-14	50006
3005	credit	active	2029-05-14	50001
3007	credit	hotlisted	2024-03-08	50008
3008	credit	hotlisted	2024-03-17	50010
3009	debit	hotlisted	2026-03-30	50011

Reason – Expiry

ABC Bank - Registered Bank

Add Card Details

Enter The Customer Id :

50008

Enter The Card Type :

Debit

Enter The Status :

Active

Enter The Expiration date :

03/15/2024 📅

Add Card

ABC Bank - Registered Bank

Hotlist Card

Enter The Card Id :   3010

Enter the Reason :   Expiry

Hotlist Card

| 3010 | debit | hotlisted | 2024-03-15 | 50008 |

9. Send an alert (mail) if the PAN or Aadhar details are not updated. (Email Generation)

ABC Bank - Registered Bank

Monthly Statement in the form of PDF

Enter The Customer ID : 50004

Send Email

50004	10006	Padmanabhan G	pad59@gmail.com	234567890 1	Banglore, Karnataka	------	MNP QR9012G	8000.00	2024-03-19 18:06:54	0

Regarding to update the details

C	chinnu117@outlook.com	↰ ↰ ↱ ⊞ ⋯
	To: You	Wed 3/20/2024 10:10 AM

Your Aadhar card details have not been updated! Please update it.

↰ **Reply**   ↱ **Forward**

```
354 Start mail input; end with <CRLF>.<CRLF>
Date: Wed, 20 Mar 2024 10:10:33 +0530 (IST)
From: chinnu117@outlook.com
To: chinnu117@outlook.com
Message-ID: <1563982592.0.1710909633808@LT6023.solartistech.local>
Subject: Regarding to update the details
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Your Aadhar card details have not been updated! Please update it.
.
250 2.0.0 OK <KL1PR02MB82038B887F44D3AAE0BCD4C4FC332@KL1PR02MB8203.apcprd02.prod.outlook.com> [Hostname=KL1PR02MB8203.apcprd02.prod.outlook.com]
DEBUG SMTP: message successfully delivered to mail server
QUIT
221 2.0.0 Service closing transmission channel
Success .. . . . . .
```

10. Show last logged in details (lastLoggedInDetails.jsp)

ABC Bank - Registered Bank

Last Logged In Details

Enter The Customer ID : 50011

Get Time

The Details of The customer:

Customer ID: 50011

Full Name: Shashank S

Last Logged In Time: 2024-03-19 18:07:12