Banking Application

Business Scenario

A Prestige Banking System, offers a wide variety of loans and services for their customers which has a requirement of having an online net banking, where customers can see their account activities online instead of visiting the bank branch, do online transactions instead of using cheque’s to save the customers time.

Moreover customers would come to know about the new changes and offers the bank make that could be the rate of interest and charges apply for receiving message or having debit card and credit card.

The details of the customers and their accounts has to be maintained in the database and access it through the UI.

The Application will have UI that would be developed using some UI Technologies, the team has to create a home page so that as soon as the customer accesses the application the home page must be displayed through that home page he can visit other pages that could be Investors page, contact us page and etc.

The application should allow customer to access various information’s like what all the transaction’s he has done with the date. The customer could able to change his log in password and transaction password, If he wishes to change the password the application should allow him to change passwords which are not used previously i.e., older passwords must not be accepted by the application.

Customer should able to transfer the amount from one account to another account while transferring the amount the application should ask all the required information of the destination account which are mentioned in the Activities . When user tries transferring the amount the application should ask him to enter his transaction password, failing to which the amount should be prevented to credit to the destination account.

The application must have other pages that can be accessed without logging in like contact us if the user goes to this page he should see the details and address of the bank, an investor page should have the investors list on the bank

Team has to create all the required tables that are mentioned in the problem statement and implement the application according to the business scenarios, the implementation details are mentioned in the Activities

Problem Statement

Assumption

We assume that there is right now only one bank and customer’s details is already stored with some amount of money in their account. Firstly design a database table based on the following information’s. Create primary key, foreign key references and other constraints wherever necessary.

**Bank**

Contains details about the bank id, bank name, IFSC, branch and number of customers.

**Customer**

Contains details about the customer id, name, age, login password and bankid (customers would use customer id and login password for login, whereas bank id is used at the time transactions)

**Account**

Contains details about the account number, customer id, account type (savings/current / salary), IFSC, transaction password, account creation date and time, transfer limit and minimum balance.

**Address**

Contains customers address details about address id, street name, state, city, pin and customer id.

**Transaction Details**

Contains transaction details about transaction id, reference number, account number of the customer, transaction type (credit/debit), transaction date and time, bank id and IFSC. (Reference number will be duplicate as it will be shared by sender and receiver both).

**Password Details**

Contains the password information about password id, customer id, account number, old login password, new login password, login password creation date and time, new transaction password, old transaction password and transaction password creation date and time.

**Business process in the application and use cases**

**Note:** Team would implement this using any Front end & Back end technologies

1. After entering the **URL** the application should take the user to the home page which would have some **links** like **home, investors, about us and contact us** these links should be common for all the pages to a user who can visit after he clicks on any of the link (ex. If he clicks on investors it should show number of investors and their details as well as the page should also show the links as explained above). Here the user can be guest or customer they could be able to see the pages without **logging in.** Team has to provide information on all the pages which are linked.
2. The home page should also have a separate section for **displaying images** regarding some advertisements and offers which should be keep changing after some seconds these must be common in all other linking page from home page but after **customer logs** in these links and images should not appear.
3. If a Customer **visits the home page** he should have a **login section** where he should be able to login by entering **valid customer id and login password**, failing to which he should be redirected to the same login page with a proper error message. After **successful authentication** he should be able to see an authenticated page which will have his **name, account number, account type and available balance.** On the same page he should also have **links for Account Activities, Transfers, Change Password and logout.**
4. On clicking on **Account Activities** he should get a page which **should have all the transactions** he has done in a table like **transaction id, account number, amount, transaction type, reference number and date and time of the transaction.**
5. On clicking on **Transfers** he should get a page which should display a form that should accept user input like **destination account number, name , IFSC code and amount,**  once you click on transfer button it should **ask customer** to enter **transaction password** if its incorrect then error must be displayed and allow to enter the transaction password again, if password entered is correct then it should be credited to the destination account and also application/database should be able **to auto-generate numbers for transaction id and reference number** whose values should be stored in a transaction table, the transaction id which will be unique but **reference number will be common for source and destination account.** These details present in the **transaction table** are useful when customer wants to see his account activities. Once the amount is transferred to anyone’s account the amount in the **destination account** table should also be updated as a total amount the account has. Store the date, bankid and IFSC when the transaction happens accordingly (make use of the other table information’s). The transaction table just maintains the **transactions** done by all the customers this table is used by the application properly when customer wants to check his transaction details.
6. On clicking change password application should allow customer to change either login/transaction password or both

**Note:** Application should not allow customer to store old passwords, make use of the password table to track the old and new one

1. On clicking on logout customer should be logged out

**Note: make sure that links like account activities, transfers, change password and logout are visible in all the pages you visit after the log in.**

1. Tools to be used:

* RDBMS Database
* JDK 1.8 or later
* Server
* Eclipse IDE
* Visual Studio Code

1. Activities to be done by the students

Students should first create all the tables like Bank, Customer, Address, Account, Transaction\_Details, Password\_Details and apply the relationships from one table to another. E.g., account number column of Transaction\_Details table would reference to the account number column of the Account table so that when customer needs to find out the account activities he should get all the transaction done.

Note: Ensure that primary key constraint is given for all the tables

After creating the tables and their relationships they have to store some records to each table (at least 5 records), Once all the database tasks are over students can concentrate on the next module.

Student are going to create UIs here, firstly they have to configure an home page for the application so that as soon as they access the application through an URL it should show this home page, the home page will have following components

* An heading at the top which displays the bank name and footer at the bottom of the page, heading and footer should appear on all other pages the user visits.
* Below the heading a common navigation links like **Home, Login, Investors, About Us, Contact Us.** These navigation links should appear on all other pages the user visits, ex if he visits Investors page user would be directed to Investors page there user should able to see the heading, footer and navigation links, same is applied for Login About Us and Contact Us pages
* A section that will show some images(width and height of the images should be small) which would be randomly changing these images can be for advertisements like some offers the bank provides, interest rates, its success rate, their new products and etc.
* When user clicks on the login link a login page should be displayed which should take customer id and password

If the user clicks on the Login link then the application should render a login page and should do the following

* The login page should ask a user to enter customer id and login password, If customer enters valid customer id and login password then the application should direct him to the success page by checking id and password in the database table **Customer**, else an error message should be displayed saying invalid credentials and should allow him to login again by asking id and password below the error message.

**Note: Students should use Rest Api’s, DAO and Service layers at the backend whenever they have to perform any actions like checking user credentials, checking customer activities, transactions, change password etc. and also java beans whenever they have to use the values entered from the client side with the values fetched from the database table.**

* If the user tries to login with empty customer id and login password a warning should be displayed saying the particular field can’t be empty, the input validation should be done
* Upon successful login a success page should contain the following
  + Customer details displaying his/her Name, Account Number, Account type and Balance in a proper format with good look and feel.
  + A common navigation link must be present in the success page which will have links to Account Activities, Transfers, Change Password and Logout
  + These common links are displayed across multiple pages like Account Activity, Transfers and Change Password
  + If the user clicks on **Account Activities** he should get a page which **should have all the transactions** he has done in a table like **transaction id, account number, amount, transaction type, reference number and date and time of the transaction.** Team has to **fetch these details from the tables** Account and Transaction\_Details,
  + Upon clicking on **Transfers** he should get a page which should display a form that should accept user input like **destination account number, account holders name , IFSC code and amount,**  once you click on a transfer button it should **ask the customer** to enter **his transaction password** if password is incorrect then error must be displayed and allow customer to enter the transaction password again, check for input validation and display appropriate warning message when customer tries to transfer amount with empty password, if the password entered is correct then amount should be credited to the destination account and also application/database should be able **to generate a sequence number for transaction id and reference number** whose values should be stored in a transaction table, transaction id will be unique but **reference number will be common for source and destination account (**e.g., if a customer having account number 123 credits 10000Rs to 456 account number then the transaction\_details table will have 2 record entries one for debit and another for credit having unique transaction id for both the records but common reference id for the both credit & debit)**.** These details present in the **transaction table** are useful when customer wants to see his account activities. Once the amount is transferred to anyone’s account the amount in the **destination account** table should also be updated as a total amount the account has. Store the date; bankid and IFSC when the transaction happens accordingly (make use of the other table information’s).
  + If customer clicks on change password then a page with two links to be rendered which must have **Change Login Password** and **Change Transaction Password** link, make sure the common navigation links are still present in these pages as well, if customer clicks on either of the link then 3 text fields should be rendered asking him to enter old password in the first text field, second text field should take enter new password and third text field should take confirm new password. Following requirements to be met while changing either of the passwords i.e., for Login and Transaction passwords : -
    - A warning message if the text fields are empty submitted
    - **Old passwords should be first checked in the database table whether its matching to logged in customer id or not,** if not an error message should be displayed saying old password is not matching
    - **New password should match the following criteria like minimum 8 characters in length, in that at least one special character like @, \*, $, one number, one upper case letter,** failing to which an error message should be popped to client asking him to enter the password again
    - **New password’s and confirm passwords should match** failing to which an error message should be popped
    - **Students should also prevent customers entering any of his previous passwords for both login and transaction passwords;** use the Password\_Details table to check all his previous passwords as it has details like customer id, account number, old password, new password, date and etc.
    - Students have to implement these business rules for login password and transaction password both
    - Once the change password has met all the above conditions then old password and new password to be stored in the Password\_Details
    - **Students should also allow customer to change either of the password** i.e., if customer wants to change only login password but not transaction’s then care should be taken to update only login password by creating a new record in the Password\_Details table by updating only login password and retaining the current transaction’s password as it is same is applied if customer wants to change only transaction password.
    - **Password\_Details table** will have columns like old login password and old transaction password which would be initially empty for the new customers as they are new customers old passwords wouldn’t be there until they update their passwords
  + If customer clicks on logout then session should be terminated
  + **Once the session is terminated and user tries to access any of the URL related to account details, transfer or change password** an error page asking him/her to login first to access this page should be rendered along with customer id and login password form so that user can enter id and password to login.