

Project Synopsis

Title of the Project

Bank Application with Account and Transaction Management

1. Introduction

In the modern banking era, digital banking applications have become an essential part of financial management. This project aims to develop a bank application that allows users to create accounts, manage transactions, and securely store their data in a MySQL database. Additionally, the project generates Excel reports for customer data and integrates a Power BI dashboard for data visualization and Machine Learning Model for prediction.

2. Objectives

- To develop a user-friendly banking application with a GUI.
- To implement OTP-based email verification for secure account creation.
- To securely store user data in a MySQL database.
- To provide functionalities for account creation, deposit, withdrawal, and transaction history.
- To integrate Power BI for data visualization and generate Excel reports for customer insights.

3. Scope of the Project

- User authentication and account creation with OTP verification.
- Secure storage of user details and transactions.
- **Transaction functionalities:** deposit, withdrawal, and balance inquiry.
- Power BI dashboard for visual insights.
- Automatic generation of transaction reports in Excel format.
- **Admin functionalities:** View customer details, close accounts and update customer information

4. Technologies Used

- **Backend:** Python
- **Database:** MySQL
- **Database Connection:** MySQL with pymysql for database interactions.
- **Frontend:** Tkinter, CustomTkinter (GUI-based)
- **Visualization:** Power BI
- **Other Libraries:** Pandas (for creating excel file), SMTP (for email-based OTP verification), OpenPyXL (for Excel file handling), Random (OTP generation)

5. System Architecture

- User enters details to create an account with OTP verification via email.
- Python connects to MySQL using pymysql, handling queries for storing and retrieving user data.
- Data is securely stored in MySQL.
- Users can generate and download transaction reports in Excel format.
- Power BI visualizes transaction data for analysis.

User Interaction Layer (Frontend)

- Built with CustomTkinter for GUI-based banking features.
- Allows users to sign up, log in, perform transactions, and view reports.

Backend Processing Layer

- Python handles requests, business logic, and connects with the database.
- SMTP email service sends OTP for account verification.
- Python connects to MySQL using pymysql, handling queries for storing and retrieving user data.
- Data is also exported to Excel for reporting.

Database Management Layer

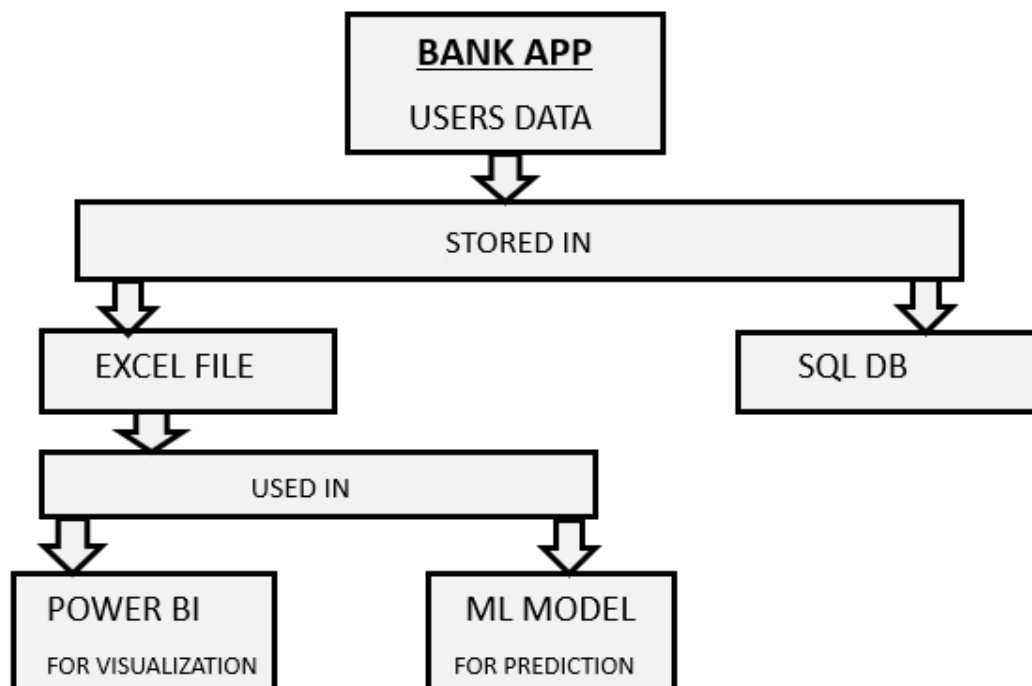
- MySQL stores user details, transactions, and account-related data securely.

Machine Learning Layer

- Logistic Regression & AdaBoost Classifier analyse user data for predictions.
- Helps in user behaviour analysis or risk assessment.

Visualization & Reporting Layer

- Power BI processes Excel data for graphical insights into transactions and trends.



6. Methodology

1. **Requirement Analysis** – Identify core functionalities such as user authentication, account creation, deposit, withdrawal, and transaction history.
2. **Database Design** – Design the MySQL database schema, including tables for users, accounts, and transactions, ensuring data integrity and security.
3. **Backend Development** – Implement Python-based GUI using CustomTkinter, database interactions with MySQL, and email OTP verification using SMTP.
4. **GUI Development** – Develop an interactive banking interface using CustomTkinter for account management and transactions.
5. **Integration & Testing** – Connect GUI with the database, test OTP verification, and validate transaction processes.
6. **Deployment** – Deploy the application locally. The application is also converted into an executable file using **PyInstaller** for easy distribution and installation.

7. Expected Outcome

- A functional GUI-based banking application with account and transaction management.
- Secure data storage and transaction handling.
- OTP-based email verification for enhanced security.
- Data visualization for transaction insights.
- Excel report generation for transaction history and customer insights.

8. Conclusion

This banking application enhances digital banking experiences by providing a secure and user-friendly platform for account and transaction management. The addition of OTP verification and Excel report generation improves security and usability.

9. Future Scope

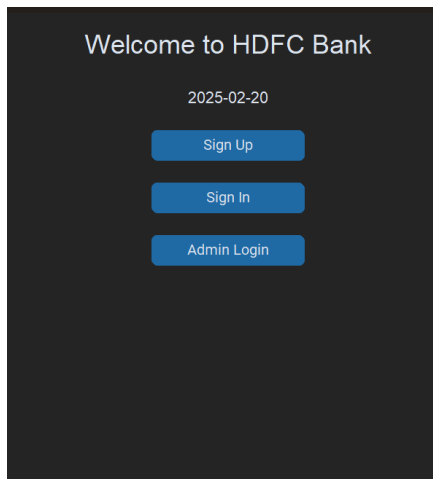
- Introducing an interest calculation feature based on account type (savings or current).
- Adding loan and credit services.
- Implementing AI-based financial recommendations.

10. GitHub Repository

<https://github.com/Prakshi-23/Bank-Application->

<https://github.com/Prakshi-23/Bank-App-management-project-v1->

Home Page



Welcome to HDFC Bank

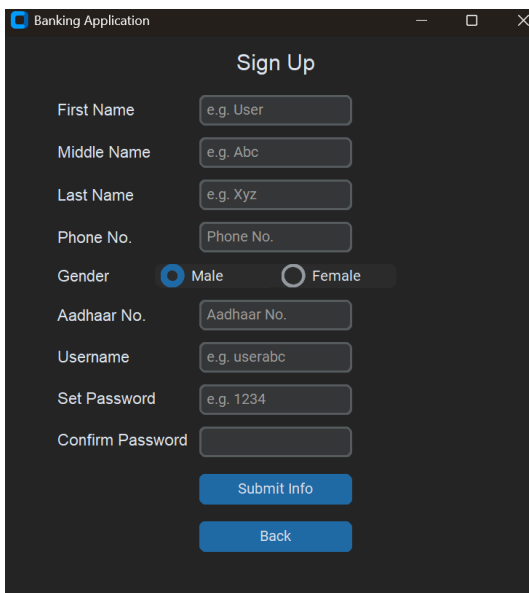
2025-02-20

Sign Up

Sign In

Admin Login

Signup Form – Page-1 →→→ Page-2



Banking Application

Sign Up

First Name

Middle Name

Last Name

Phone No.

Gender ☒ Male ☐ Female

Aadhaar No.

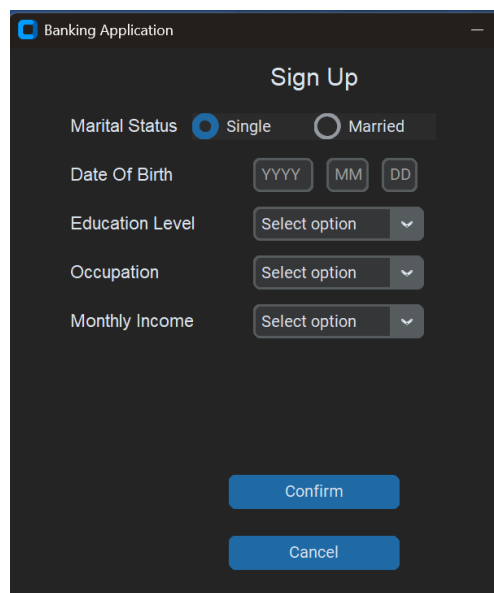
Username

Set Password

Confirm Password

Submit Info

Back



Banking Application

Sign Up

Marital Status ☒ Single ☐ Married

Date Of Birth

Education Level

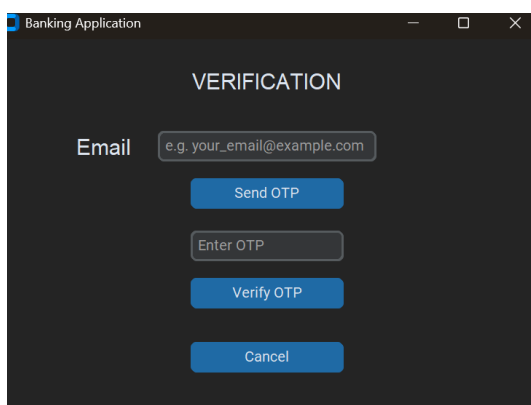
Occupation

Monthly Income

Confirm

Cancel

OTP Verification Through Email



Banking Application

VERIFICATION

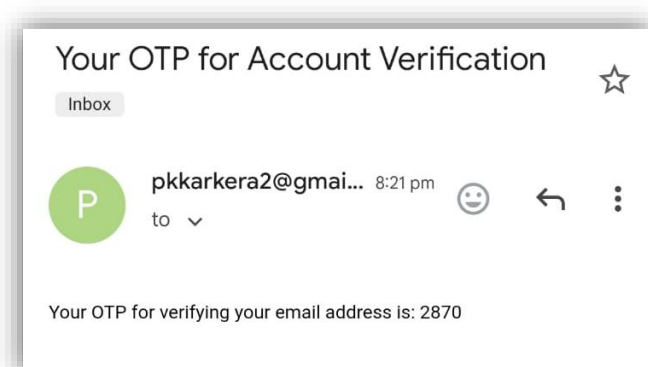
Email

Send OTP

Enter OTP


Verify OTP

Cancel



Your OTP for Account Verification ☆

Inbox

 pkkarkera2@gmai... 8:21 pm
to ▾

Your OTP for verifying your email address is: 2870

Signin Page →→→ After Login Page

Sign In

Username

Password

Log In

Back

Welcome, A

Deposit

Withdraw

Check Balance

Transaction Report

Change Password

Log Out

Admin Operations →→→→ Update Info Page

Admin Panel - Welcome, Aayush

View All Customers

Close Customer Account

Update Customer Info

Log Out

Banking Application

Update Customer Info

User Id

10001

Retrieve Info

First Name

Prakshi

Middle Name

Keshav

Last Name

Karkera

Phone No.

9324205835

Gender

Male

Female

Marital Status

Single

Married

Education Level

Graduation

Occupation

Student

Monthly Income

None

Save Changes

Back

Power Bi dashboard

