**OBJECT ORIENTED PROGRAMMING LAB**

**Final Project Report (Semester 2)**

**Banking System in Java**

**Introduction:**

In this project, there is a banking system provided which is written in java language and coded on “VS Code”. In this program you can perform multiple tasks which are Available in a Banking Management System, Like Creating Account, Checking account Details, balance withdrawal/deposit, and also just displaying account details.

The Banking System project aims to develop a Java-based application that simulates a banking system with various account types and functionalities. The project demonstrates the use of object-oriented programming concepts, such as inheritance and polymorphism, to model different types of accounts, handle transactions, and maintain customer details.

**Main Function:**

It contains a menu with options for multiple choices like Create Savings Account, Create Checking Account, Create Credit Account, Deposit, Withdraw, Display Account Details, Exit. The user can choose an option by entering a number from 1 to 7. The switch statement takes the user's choice as input and performs the corresponding action by calling the appropriate function. If the user enters 7, the program terminates. If the user enters an invalid choice, the program displays an error message. The program loops until the user enters 7.

**Project Scope and Features:**

The Banking System project encompasses the following key features:

* Account Creation: Users can create savings, checking, and credit accounts by providing relevant information such as account number, account holder name, and specific details based on the account type.
* Deposit: Users can deposit a specified amount into their accounts, increasing the account balance.
* Withdrawal: Users can make withdrawals from their accounts, considering any applicable limits or overdraft facilities based on the account type.
* Account Details: Users can view the account details, including the account number, account holder name, and current balance.
* Transaction Handling: The system manages various transactions, including deposits and withdrawals, ensuring data consistency and account integrity.

**System Design and Implementation:**

The Banking System is implemented using Java programming language, utilizing object-oriented principles. The project consists of several classes, including the abstract class 'Account,' which serves as the base class for savings, checking, and credit accounts. Each account type is derived from the 'Account' class, implementing its own withdrawal method based on specific rules and limits.

The 'Account' class defines common attributes such as account number, account holder, and balance. It also provides methods for depositing funds, retrieving account details, and handling polymorphic withdrawals. The derived classes, such as 'SavingsAccount,' 'CheckingAccount,' and 'CreditAccount,' extend the 'Account' class and override the withdrawal method to incorporate account-specific logic.

The main class, 'BankingSystem,' acts as the entry point of the application. It utilizes a list to store and manage created accounts. The class provides a menu-based interface, allowing users to create different account types, perform transactions, display account details, and exit the system. It also includes a helper method, 'findAccount,' to search for a specific account based on the account number.

**Usage and User Interface:**

Upon running the application, users are presented with a menu that prompts for their desired action. The menu options include creating savings, checking, or credit accounts, making deposits or withdrawals, displaying account details, and exiting the system. Users input the required information, such as account numbers, account holders' names, and specific details based on the chosen account type.

The system validates the inputs, performs the requested operations, and provides appropriate feedback messages. For example, when creating an account, the system confirms successful creation. When making deposits or withdrawals, the system confirms the transaction and updates the account balance accordingly. In case of any errors or invalid inputs, appropriate error messages are displayed.

**METHODS:**

Number of different methods have been used in the program. “If-else” have been used enormous times, along with “switch statement” which almost performs same as if-else. The most important function which has been coded is Array-List. It stores data from one function to multiple functions (according to user’s wish).

**Conclusion:**

The Banking System project demonstrates the implementation of a Java-based banking application, showcasing object-oriented programming principles and providing basic banking functionalities. Through the project, we have gained practical experience in designing and developing software systems, handling user interactions, and implementing core banking features. The system can serve as a foundation for further enhancements or as a learning tool for understanding object-oriented programming concepts and their application in real-world scenarios.

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