UNICOM TIC Banking System - Detailed Function Usage Table

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| Function | Purpose | Where Used | Logic Explanation |
| hash\_password() | Hashes plain password using bcrypt for secure storage | Used in: createAccount(), readCredentials(), login() | This function converts a user's plain password into a hashed version using bcrypt, which adds a salt to protect against rainbow table attacks. It ensures stored passwords are not readable even if the file is exposed. |
| check\_password() | Checks if input password matches stored hashed password | Used in: login() | Uses bcrypt to compare the user’s entered password with the stored hash. This prevents exposing plain passwords and ensures authentication security. |
| clearScreen() | Clears the terminal screen | Used in: startMenu(), adminMenu(), userMenu(), createAccount() | Clears the console screen for both Windows and Unix systems to keep the UI clean and readable after each operation. |
| accountInactive() | Checks account status from file | Used in: readCustomer(), deposit(), withdraw(), checkBalance(), transferMoney(), login() | Reads the CustomerProfiles.txt file and returns True if the account’s status is marked as 'Inactive', which is used to block operations on closed accounts. |
| firstGetAccountsInfo() | Reads account numbers, names, and balances | Used in: firstReadAllData() | Loads all account basic details into a dictionary so in-memory operations (like deposit/withdraw) can be handled efficiently. |
| firstGetTransactionsInto() | Adds transaction logs to each account | Used in: firstReadAllData() | Attaches each transaction string to its corresponding account in memory, using account numbers as keys. |
| firstReadAllData() | Initializes all account data and transactions into memory | Used in: startMenu() | Combines account info and transactions to prepare the system for real-time usage after login. |
| generateAccountNumber() | Creates a new unique account number | Used in: createAccount() | Finds the highest existing account number in the file and increments it by 1 to ensure each new account is unique. |
| writeAccountDetails() | Appends new account info to file | Used in: createAccount(), applyMonthlyInterest() | Writes the account number, name, and balance to the AccountDetails.txt file, ensuring persistent storage of new accounts or updated balances. |
| writeTransaction() | Logs a transaction to file | Used in: deposit(), withdraw(), transferMoney(), applyMonthlyInterest() | Saves each transaction message with the account number to maintain a permanent audit trail. |
| readCredentials() | Loads login data from credentials.txt | Used in: startMenu(), login() | Parses the credentials.txt file and stores the data in a dictionary for fast username lookup during login. |
| login() | Handles user/admin login logic | Used in: startMenu() | Authenticates users by matching entered credentials, determines their role, and returns account number if user is not an admin. |
| getDobFromNic() | Extracts DOB and gender from NIC | Used in: createAccount(), updateCustomer() | Analyzes the NIC number (old or new format) to calculate date of birth and determine gender using logic based on day-of-year encoding. |
| getValidatedInput() | Validates form inputs | Used in: createAccount(), updateCustomer() | Checks if input values match required formats (NIC, phone, email). If not, it prompts user to enter valid data again. |
| confirmBeforeSaving() | Displays a summary and asks confirmation before saving | Used in: createAccount() | Shows all collected account data to the user and confirms if they want to proceed with saving it to files. |
| searchCustomerBy() | Searches for customers by NIC or phone | Used in: adminMenu() → Option 12 | Scans the CustomerProfiles.txt for a matching NIC or phone number and displays associated customer details. |
| AccountType() | Lets user select account type (Savings/Current) | Used in: createAccount() | Prompts the user to choose an account type, which determines whether interest will be applied. |
| createAccount() | Full process of creating a customer and storing all info | Used in: adminMenu() | Collects user details, validates input, extracts DOB from NIC, writes all account and profile info to respective files, and generates credentials. |
| readCustomer() | Displays customer profile details | \  Used in: adminMenu(), userMenu() | Reads the CustomerProfiles.txt and formats the matched customer record using a styled table output. |
| restoreCustomer() | Reactivates a previously soft-deleted account | Used in: adminMenu() | Changes the status of an 'Inactive' account to 'Active' and logs the reactivation. |
| updateCustomer() | Allows editing customer profile fields | Used in: adminMenu() | Lets admin update phone, email, address, name, or NIC. Changes are logged in change\_log.txt for tracking. |
| softDeleteCustomer() | Marks account as Inactive and logs reason | Used in: adminMenu() | Changes customer status to 'Inactive' instead of deleting and logs the reason in deactivation\_log.txt. |
| deposit() | Adds funds to an account | Used in: adminMenu(), userMenu() | Validates access, ensures account is active, updates in-memory balance, and logs transaction. |
| withdraw() | Deducts funds from an account | Used in: adminMenu(), userMenu() | Checks for sufficient balance, then deducts amount and logs the transaction. |
| checkBalance() | Displays current balance | Used in: adminMenu(), userMenu() | Shows the current balance for the account entered, with permission check for users. |
| viewTransactions() | Shows full transaction history | Used in: adminMenu(), userMenu() | Displays all transaction logs from memory using tabulate for nice formatting. |
| transferMoney() | Transfers funds between two accounts | Used in: adminMenu(), userMenu() | Checks both sender and receiver accounts, then updates balances and logs transactions for both sides. |
| applyMonthlyInterest() | Applies interest to all active savings accounts | Used in: startMenu() | Calculates monthly interest if it hasn’t been applied yet for the month and updates account balances. |
| viewInterestHistory() | Displays all past interest records | Used in: adminMenu() | Reads interestlog.txt and displays account, date, amount, and interest rate in a table. |
| adminMenu() | Provides admin users with full functionality | Used in: startMenu() | Displays menu options for creating, editing, and managing accounts, transactions, and logs. |
| userMenu() | Limited menu for regular users | Used in: startMenu() | Allows logged-in customers to manage their own account operations like deposits, transfers, etc. |
| startMenu() | Main control flow for launching the system | Main function | Initializes accounts, reads credentials, handles login, then redirects to appropriate menu based on user role. |