START

CLASS LibraryApp:

METHOD __init__:

Set up window (fullscreen, title)

Initialize current_user and tree

Show login UI

METHOD clear_frame:

Destroy all widgets in window

METHOD create_login_ui:

Clear frame

Show login form (SR Code, Password, User Type)

Show Login and Register buttons

METHOD login:

Get SR Code, password, user type from entries

IF credentials valid:

Set current_user

IF Admin: show admin dashboard

ELSE: show student dashboard

ELSE:

Show error

METHOD register:

    Get SR Code, password, user type from entries

    IF all fields filled:

        IF user exists: show error

        ELSE: add user, show success

    ELSE:

        Show warning

METHOD create_student_dashboard:

    Clear frame

    Show dashboard label and buttons (Profile, Borrow Book)

    Show search bar and book list

METHOD search_book:

    Get search term

    IF empty: show warning

    ELSE: filter books and update Treeview

METHOD borrow_selected_book:

    IF no book selected: show warning

    ELSE: open borrow form (entries for name, program, contact, SR code)

        On confirm: call confirm_borrow

METHOD confirm_borrow:

    Get form entries

    IF any empty: show warning

    ELSE:

        Add book to borrowed_books for current_user

        Show success message with due date

        Remove book from Treeview

METHOD return_book:

    IF no book selected: show warning

    ELSE:

        Remove book from borrowed_books for current_user

        Show success message

        Remove book from Treeview

METHOD show_student_profile:

    Clear frame

    Show profile info and buttons (Borrowed Books, Back, Logout)

METHOD borrowed_books:

    Clear frame

    Show borrowed books for current_user in Treeview

    Show Return Book and Back buttons

METHOD create_admin_dashboard:

    Clear frame

    Show dashboard label and buttons (Profile)

    Show search bar and book list (Treeview)

METHOD search_book (admin):

    Get search query

    Filter books and update Treeview

METHOD populate_treeview:

    Insert books into Treeview

METHOD show_admin_profile:

    Clear frame

    Show admin profile and buttons (Add Book, Manage Students, View Borrowed Books, Back, Logout)

METHOD add_book:

    Open form for book details

    On confirm: call confirm_add_book

METHOD confirm_add_book:

    Get form entries

    IF any empty: show warning

    ELSE: add book to books list, show success, return to dashboard

METHOD show_borrowed_books:

Clear frame

Show all borrowed books in Treeview

Show Back button

METHOD manage_student_accounts:

Clear frame

Show buttons (Add Student, Delete Account)

Show student accounts in Treeview

Show Back button

METHOD refresh_student_tree:

Refresh student accounts Treeview

METHOD add_student:

Open form for student details

On confirm: call confirm_add_student

METHOD confirm_add_student:

Get form entries

IF any empty: show warning

ELSE IF student exists: show error

ELSE: add student, refresh tree, show success

METHOD delete_student_account:

    IF no student selected: show warning

    ELSE: confirm deletion, remove from users and Treeview

MAIN:

  Create LibraryApp instance and run mainloop

END