

# Lab 1: Building Desktop Applications using PyQt6

CS355/CE373 Database Systems  
Fall 2024



**Dhanani School of Science and Engineering**  
Habib University

# Contents

<b>1</b>	<b>Instructions</b>	<b>2</b>
1.1	Marking scheme . . . . .	2
1.2	Late submission policy . . . . .	2
<b>2</b>	<b>Objective</b>	<b>2</b>
<b>3</b>	<b>Exercise</b>	<b>3</b>

# 1 Instructions

- This lab will contribute 1% towards the final grade.
- The deadline for this lab is one week after your lab ends. **However, you must also submit all the work completed in the lab at the end of the lab.**
- The lab must be submitted online via CANVAS. You are required to submit a zip file that contains both *.py* and *.ui* files.
- The zip file should be named as *Lab\_01\_aa1234.zip* where *aa1234* will be replaced with your student id.
- **Files that don't follow the appropriate naming convention will not be graded.**

## 1.1 Marking scheme

This lab will be marked out of 100.

- 50 Marks are for the completion of the lab.
- 10 Marks are for filling the feedback form within the lab timings.
- 40 Marks are for progress and attendance during the lab.

## 1.2 Late submission policy

No late submissions are allowed for this lab.

# 2 Objective

The goal of this lab is to teach students how to create desktop-based applications using PyQt6 and Qt Designer. This lab introduces them to various types of graphical user interface (GUI) controls and associated event-handling systems.

### 3 Exercise

You must design a Desktop form in PyQt6 that supports the following functionality:

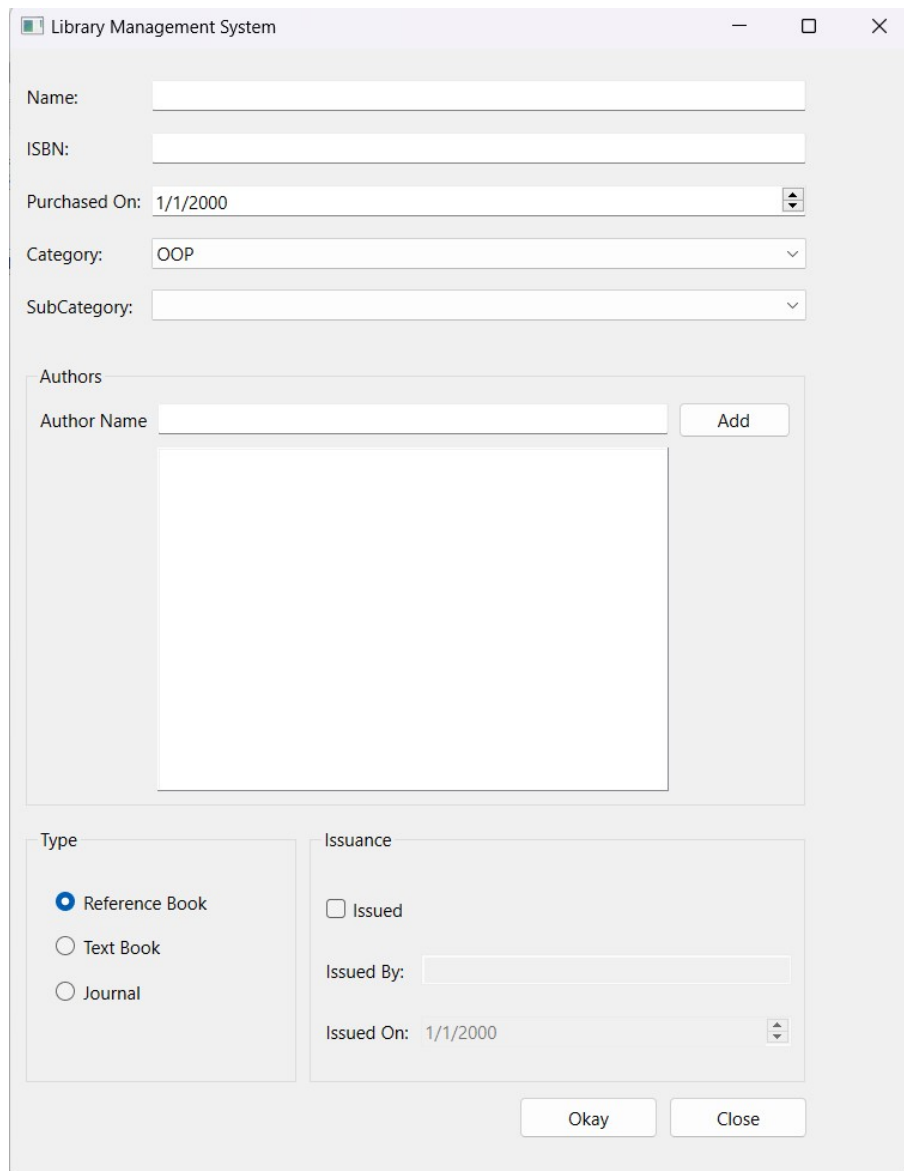


Figure 1: Desktop Form in PyQt6

1. The Category combo box will show the following options:
  - Database Systems
  - OOP
  - Artificial Intelligence
2. When a category is chosen, the related subcategories are displayed in the subcategory combo box. Each category is subdivided as follows:
  - Database Systems
    - ERD
    - SQL

- OLAP
  - Data Mining
  - OOP
    - C++
    - Java
  - Artificial Intelligence
    - Machine Learning
    - Robotics
    - Computer Vision
3. A book can have many authors. Authors can be added by entering their names in the text box and clicking the Add button. This will add the author's name to the Author's List box.
  4. A book can only be one of the following types:
    - Text Book
    - Reference Book
    - Journal
  5. If the Issuance check box is checked, it means the book has been issued to someone. Turning on/off the issuance checkbox enables/disables the 'Issued to' and 'Issue date' fields.
  6. The form will verify the following rules when you press the OK button:
    1. The ISBN should not be more than 12 characters long.
    2. The 'Purchased on' date must be earlier than today.
    3. If the book is of the type 'Journal' it will have no author; otherwise, it must have at least one author.
    4. If the book is issued to someone, the 'Issued to' field must not be empty, and the 'Issue date' field must be more than the 'Purchased On' field but less than today's date.

If all the conditions are verified, then there should be a confirmation dialog box which should display the following message:

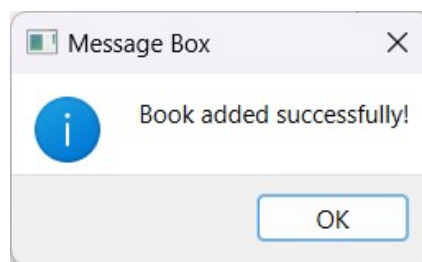


Figure 2: Book added successfully message box

However, if conditions are not verified, then there should be a confirmation dialog box which should display which conditions have failed.

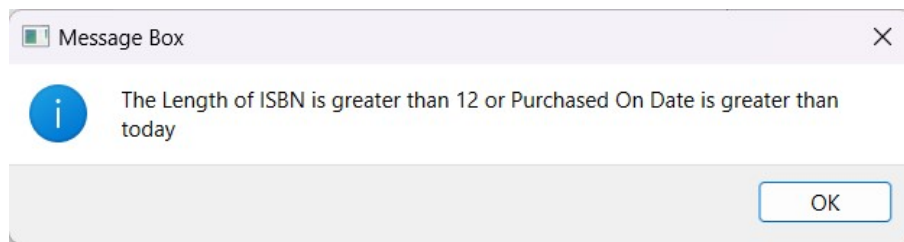
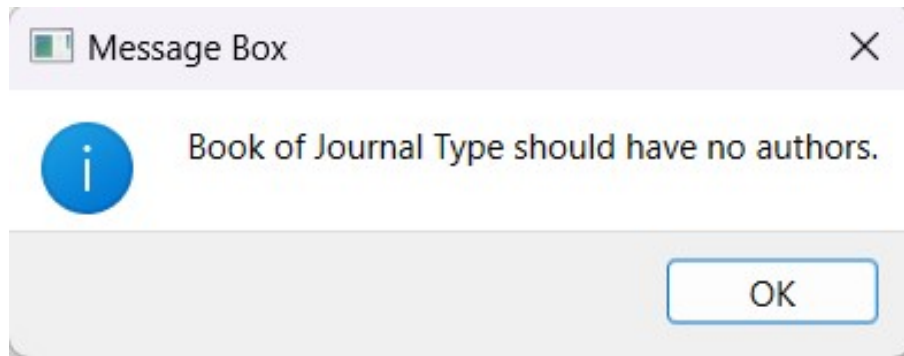
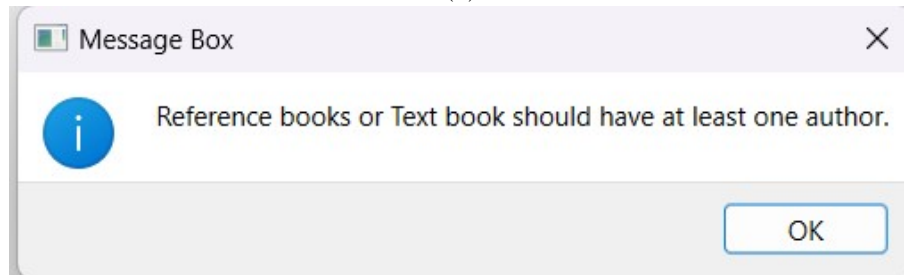


Figure 3: Error message displayed when condition 1 or 2 fail.



(a)



(b)

Figure 4: Error message displayed when condition 3 fails.



Figure 5: Error message when condition 4 fails.

7. The application will close upon clicking the close button.