



DIPLOMA IN LIBRARY INFORMATICS

UNIVERSITI TEKNOLOGI MARA (UITM) KEDAH, CAMPUS SUNGAI PETANI
FACULTY OF INFORMATION SCIENCE STUDIES COLLEGE OF COMPUTING,
INFORMATICS AND MATHEMATICS

IML208 PROGRAMMING FOR LIBRARIES

GROUP ASSIGNMENT

PREPARED BY:

NAME	STUDENT NO
NUR FARISHA ALEEYA BINTI MOHAMED ZAKHARI	2022644296
NURIN ANISA BINTI ANUAR	2022834762
PUTRI NUR YASMEEN BINTI ADIE PUTRA	2022663052
WASILATUL 'ATHIYYAH BINTI MOHAMMAD JALI	2022893212

CLASS:

CDIM1443B

PREPARED FOR:

SIR AIRUL SHAZWAN BIN NORSHAHIMI

SUBMISSION DATE:

17th JANUARY 2024

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1.0 INTRODUCTION

In today's digital age, libraries are embracing technology to streamline their operations and enhance the borrowing experience for their patrons. One essential aspect of library management is the rental book system, which allows users to borrow books and keep track of due dates, fines, and book availability.

The form is built using the Tkinter library in Python and provides fields for entering book ID, book title, book type, book price, and date of borrowing. The main purpose of this code is to capture book details from users and perform actions such as updating, deleting, or submitting the entered book information. However, it is important to note that the functionality for these actions is not implemented in the code. The form includes various user interface elements such as labels, entry fields, dropdown menus, and buttons. Users can enter book information into the corresponding fields, select the book type from a dropdown menu, and interact with the buttons for update, delete, or submit.

Design a GUI-based book price calculator using tkinter that allows users to select a book type from a dropdown menu, enter the number of packs, and the number of days late. The calculator should calculate the total price based on the book type and number of packs, and also calculate the late return fine based on the number of days late. The calculated results should be displayed in the GUI. Additionally, the program should store the user's input (book type, packs, days late, total price, and late return fine) in a MySQL database.

2.0 PROBLEM STATEMENT

The library currently relies on manual processes for book rentals, which are time-consuming and error prone. Library staff must manually record book check-outs, due dates, and fine calculations, leading to inefficiencies and potential inaccuracies. Additionally, library patrons face challenges in finding available books, tracking due dates, and managing fines.

Users typically purchase books from actual bookstores and libraries, or factual shops. It requires users to physically visit the libraries or stores and browse the various shelves, and it also requires store managers to stock, display, and move the merchandise that users need. To complete these procedures, personnel, time, and space are required. Additionally, the high price of new books proved to be an issue for today's students because they had to purchase books that they would only need for a short while, like for semester exams.

The Book Rental System provides a solution for reducing and optimising these costs. Authorized users do not need to go to the factual shops and libraries to choose and bring the books it can saves time and save human efforts. The customer can save money of the book price and also reusing books proves helpful to save nature.

The goal is to develop a software solution that automates and streamlines the rental book process for both library staff and patrons. The system should provide an intuitive user interface for patrons to search for books, reserve them, and receive notifications about due dates and fines. For library staff, the system should enable easy management of book records, user accounts, and fine calculations.

3.0 OBJECTIVES

1. Book Management: The system should allow library staff to add, update, and delete book records, including information such as title, author, genre, and availability status.

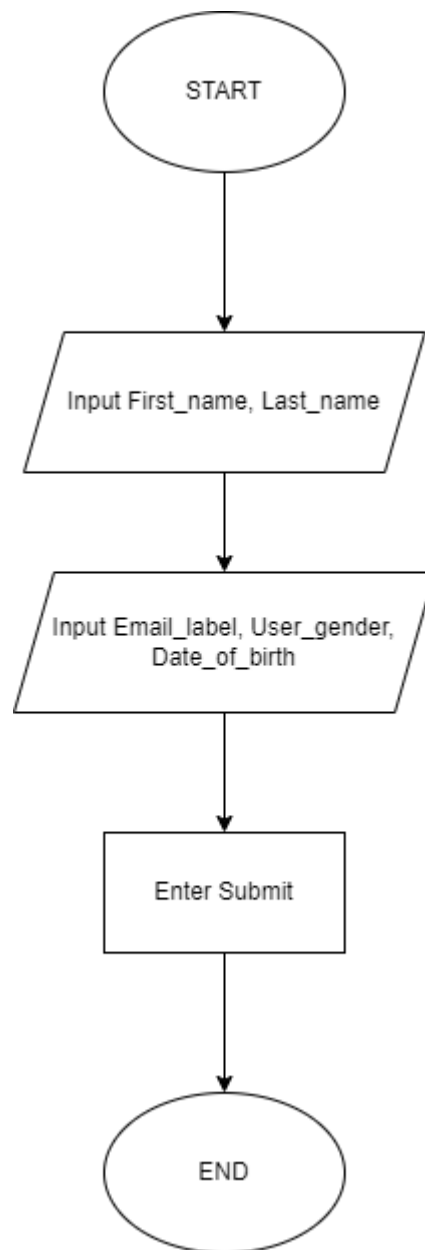
2. User Management: The system should enable library staff to create and manage user accounts, including personal information, borrowing history, and fine records.

3. Book Search and Reservation: Patrons should be able to search for books based on various criteria, such as title, author, or genre. They should also be able to reserve books if they are currently unavailable.

4. Fine Calculation: The system should automatically calculate fines for late returns based on predefined rules, such as a fixed fine rate per day or a grace period.

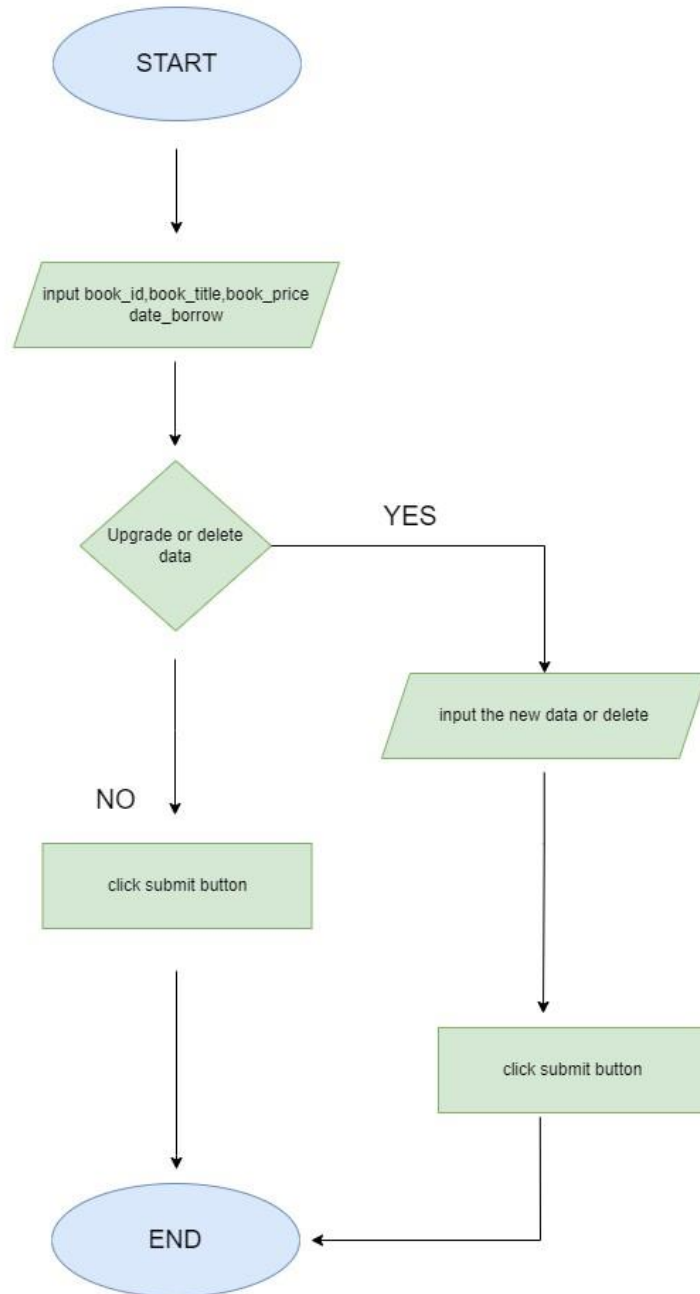
4.0 FLOWCHART

4.1 USER REGISTRATION



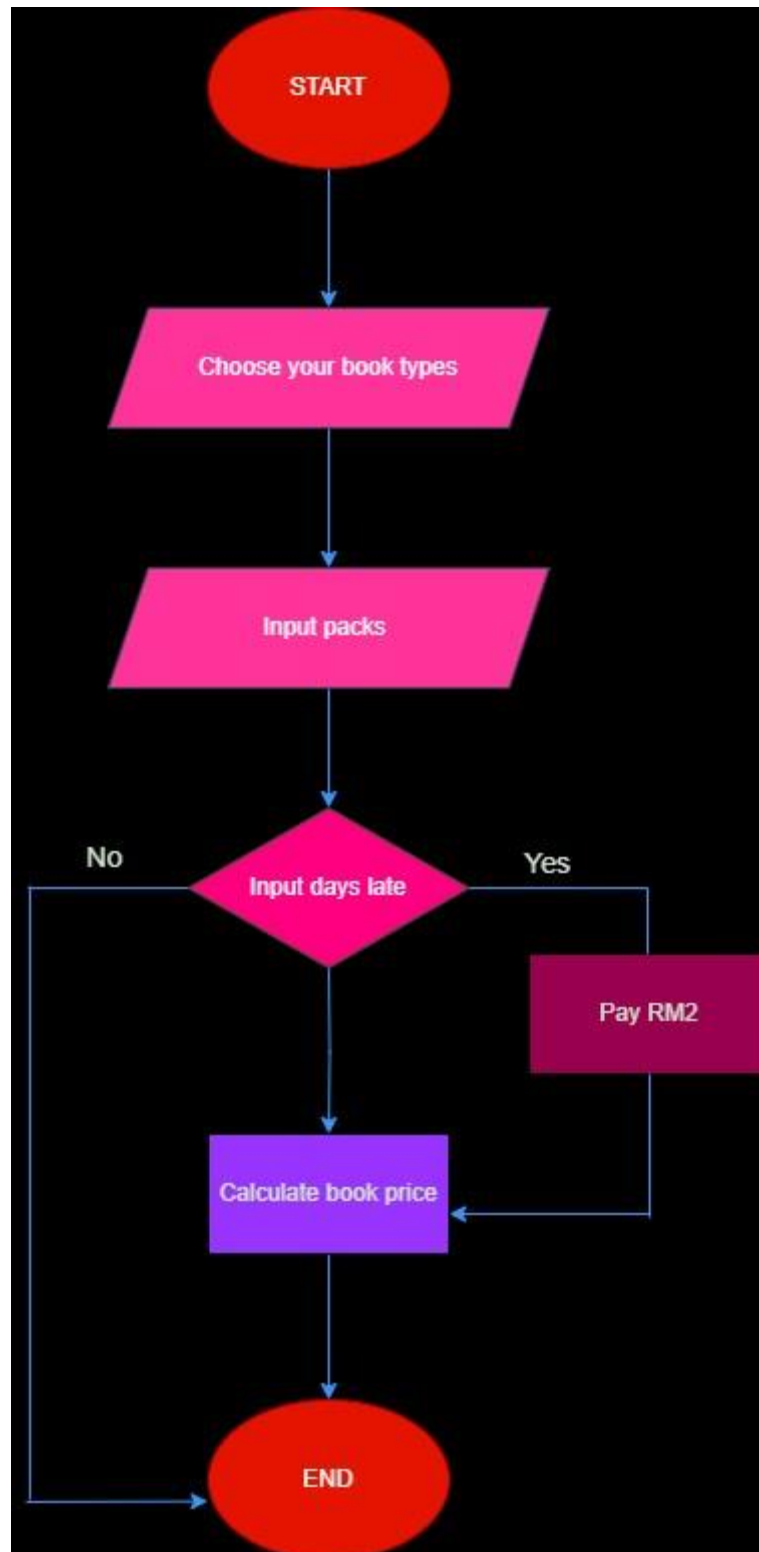
FLOWCHART 2

4.2 BOOK ENTRY



FLOWCHART 3

4.3 CALCULATION OF BOOK



5.0 SNAPSHOT OF CODE

CODE USER REGISTRATION

```
register.py > ...
1  import tkinter as tk
2  from tkcalendar import DateEntry
3  import mysql.connector
4
5  # Connect to your MySQL database
6  mydb = mysql.connector.connect(
7      host="localhost",
8      user="root",
9      password="",
10     database="register"
11 )
12
13 # Create a cursor object to execute SQL queries
14 mycursor = mydb.cursor()
15
16 # Function to handle the calculation and database saving
17 def submit_data():
18     first_name = first_name_entry.get()
19     last_name = last_name_entry.get()
20     user_email = user_email_entry.get()
21     user_password = user_password_entry.get()
22     user_gender = user_gender_label.get()
23     date_birth = date_birth_entry.get()
24
25     # To insert your Data to your database.
26     sql = "INSERT INTO user_registration (First_Name, Last_Name, User_Email, User_Password, User_Gender, Date_of_Birth) VALUES (%s, %s, %s, %s, %s, %s)"
27     val = (first_name, last_name, user_email, user_password, user_gender, date_birth)
28     mycursor.execute(sql, val)
29     mydb.commit()
30
31
32 root = tk.Tk()
33 root.title("User Register")
34 root.geometry('500x400')
35 root.configure(bg='#a36370')
```

```
register.py > ...
36
37 label = tk.Label(root, text="USER REGISTRATION", font=("New York",20,"bold"), bg='#a36370', fg='ffffff')
38 label.grid(row=0, column=1, padx=5, pady=5)
39
40 ## User first name
41 first_name_label = tk.Label(root, text="First Name", font=("New York",15,"bold"), bg='#a36370', fg='ffffff')
42 first_name_label.grid(row=1, column=0, padx=5, pady=5)
43 first_name_entry = tk.Entry(root, bd=3)
44 first_name_entry.grid(row=1, column=1, padx=5, pady=5)
45
46 # User last name
47 last_name_label = tk.Label(root, text="Last Name", font=("New York",15,"bold"), bg='#a36370', fg='ffffff')
48 last_name_label.grid(row=2, column=0, padx=5, pady=5)
49 last_name_entry = tk.Entry(root, bd=3)
50 last_name_entry.grid(row=2, column=1, padx=5, pady=5)
51
52 # User email
53 user_email_label = tk.Label(root, text="Email", font=("New York",15,"bold"), bg='#a36370', fg='ffffff')
54 user_email_label.grid(row=3, column=0, padx=5, pady=5)
55 user_email_entry = tk.Entry(root, bd=3)
56 user_email_entry.grid(row=3, column=1, padx=5, pady=5)
57
58 # User password
59 user_password_label = tk.Label(root, text="Password", font=("New York",15,"bold"), bg='#a36370', fg='ffffff')
60 user_password_label.grid(row=4, column=0, padx=5, pady=5)
61 user_password_entry = tk.Entry(root, bd=3)
62 user_password_entry.grid(row=4, column=1, padx=5, pady=5)
63
64 # User gender
65 user_gender_label = tk.StringVar(root)
66 user_gender_label.set("Gender")
67 trip_dropdown = tk.OptionMenu(root, user_gender_label, "Male", "Female")
68 trip_dropdown.grid(row=5, columnspan=2, padx=5, pady=5)
69
```

```
70 # User date of birth
71 date_birth_label = tk.Label(root, text="Date of Birth", font=("New York",15,"bold"))
72 date_birth_label.grid(pady=10, columnspan=2)
73 date_birth_entry = DateEntry(root, date_pattern="yyyy-mm-dd", bd=3)
74 date_birth_label['background'] = "#F8C8DC"
75 date_birth_entry.grid(pady=5, columnspan=2)
76
77 # Save Button
78 save_button = tk.Button(root, text="SUBMIT", font=("New York",15,"bold"), bg='#a36370', fg='ffffff', command=submit_data)
79 save_button.grid(row=8, column=0, columnspan=2)
80
81 root.mainloop()
```

5.2 Code Book Entry

```
file Edit Selection View Go Run ... GROUP ASSIGNMENT IML208
test.py 1 x test1.py 1 main_menu.py 1 data_entry.py submodules.py 1 Kindergarten_Registrtion.py 1 Holiday_Package.py 1 ind_example.py
test.py > ...
1 import tkinter as tk
2 import mysql.connector
3
4 # Connect to your MySQL database
5 mydb = mysql.connector.connect(
6     host="localhost",
7     user="root",
8     password="",
9     database="book_rent2"
10 )
11 # Create a cursor object to execute SQL queries
12 mycursor = mydb.cursor()
13
14 def enter_data():
15     book_id = book_id_entry.get()
16     book_title = book_title_entry.get()
17     book_type = book_type_var.get()
18     book_price = book_price_entry.get()
19     date_borrow = date_borrow_entry.get()
20
21
22 # Inserting data into a table
23 sql = "INSERT INTO book_entry_form (book_id, book_title, book_type, book_price, date_borrow) VALUES (%s, %s, %s, %s, %s)"
24 val = (book_id, book_title, book_type, book_price, date_borrow)
25 mycursor.execute(sql, val)
26 mydb.commit()
27
28 # Your Main window, You need to have the title, geometry (MUST)
29 root = tk.Tk()
30 root.title("Book Rent")
31 root.geometry("500x550")
32 root.configure(bg="#C1B8A3")
33
34
35
36
37
38
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Edit Selection View Go Run ... GROUP ASSIGNMENT IML208
test.py 1 x test1.py 1 main_menu.py 1 data_entry.py submodules.py 1 Kindergarten_Registrtrion.py 1 Holiday_Package.py 1 ind_exan
test.py > ...
62 # Gender Dropdown
63 book_type_var = tk.StringVar(root)
64 book_type_var.set("Select Your Book Type")
65 # Default value before your selection
66 book_type_dropdown = tk.OptionMenu(root, book_type_var, "Journal", "Encyclopedia", "Special Book")
67 book_type_dropdown.grid(pady=10)
68
69 book_price_label=tk.Label(frame, text="Book Price:", font=("Times New Roman",11, "bold"),bg="#BFA493")
70 book_price_label.grid(row=3, column=0)
71 book_price_entry = tk.Entry(frame, width=30)
72 book_price_entry.grid(row=3, column=1, pady=20)
73
74 date_borrow_label=tk.Label(frame, text="Date Borrow:",font=("Times New Roman",11, "bold"),bg="#BFA493")
75 date_borrow_label.grid(row=4, column=0)
76 date_borrow_entry = tk.Entry(frame, width=30)
77 date_borrow_entry.grid(row=4, column=1, pady=20)
78
79 # Update Button
80 update_button = tk.Button(root, text="Update",font=("Amasis MT Pro Black",11, "bold"),bg="#A36370", command=enter_data)
81 update_button.grid(row=5,column=0, padx=5, pady=10)
82
83 # Delete Button
84 delete_button = tk.Button(root, text="Delete",font=("Amasis MT Pro Black",11, "bold"),bg="#A36370", command=enter_data)
85 delete_button.grid(row=6,column=0,padx=5, pady=10)
86
87 # Submit Button
88 submit_button = tk.Button(root, text="Submit Form",font=("Amasis MT Pro Black",11, "bold"),bg="#A36370", command=enter_data)
89 submit_button.grid(row=7)
90

```

```

test.py > ...
91 # Update data
92 def edit_data():
93     book_id = book_id_entry.get()
94     book_title = book_title_entry.get()
95     book_type = book_type_var.get()
96     book_price = book_price_entry.get()
97     date_borrow = date_borrow_entry.get()
98
99     mydb = mysql.connector.connect(
100         host="localhost",
101         user="root",
102         password="",
103         database="book_rent"
104     )
105     mycursor = mydb.cursor()
106
107     # Get the total count of rows in the database
108     mycursor.execute("SELECT COUNT(*) FROM book_entry_form")
109     count = mycursor.fetchone()[0]
110
111     if count > 0:
112         # Update the last row in the database (book_id, book_title, book_type, book_price, date_borrow)
113         sql = "UPDATE book_entry_form SET book_id= %s, book_title = %s, book_type = %s, book_price = %s, date_borrow = %s ORDER BY name DESC"
114         val = (book_id, book_title, book_type, book_price, date_borrow)
115         mycursor.execute(sql, val)
116         mydb.commit()
117         print("Record updated!!!")
118     else:
119         print("No records update!!!")
120

```

```

test.py > ...
121 #Delete data
122 def delete_data():
123     book_id = book_id_entry.get()
124     book_title = book_title_entry.get()
125     book_type = book_type_var.get()
126     book_price = book_price_entry.get()
127     date_borrow = date_borrow_entry.get()
128
129     mydb = mysql.connector.connect(
130         host="localhost",
131         user="root",
132         password="",
133         database="book_rent2"
134     )
135
136     mycursor = mydb.cursor()
137
138     # Get the total count of rows in the database
139     mycursor.execute("SELECT COUNT(*) FROM book_entry_form")
140     count = mycursor.fetchone()[0]
141
142     if count > 0:
143         # Delete the last row in the database
144         sql = "DELETE FROM book_entry_form ORDER BY name DESC LIMIT 1"
145         mycursor.execute(sql)
146         mydb.commit()
147         print("Last record deleted.")
148     else:
149         print("No records to delete.")
150
151     mycursor.close()
152     mydb.close()

```

```

150
151     mycursor.close()
152     mydb.close()
153
154     root.mainloop()
155

```


5.3 CODE Calculation of book

```
calculation_assignment_wasi.py X
C:\Users\Acer\Documents\source_code\Class Materials Week 11> calculation_assignment_wasi.py > ...
1 import tkinter as tk
2 import mysql.connector
3
4 # Connect to your MySQL database
5 mydb = mysql.connector.connect(
6     host="localhost",
7     user="root",
8     password="",
9     database="calculation_book"
10 )
11
12 # Create a cursor object to execute SQL queries
13 mycursor = mydb.cursor()
14
15 # Function to handle the calculation and database saving
16 def collect_data():
17     book_type = book_type_var.get()
18     packs = int(packs_entry.get())
19     days_late = int(days_late_entry.get()) # Get the number of days late from the entry
20
21     # The price below is defined for the values from your selections
22     prices = {
23         "Journal": 20,
24         "Encyclopedia": 35,
25         "Special Book": 60,
26     }
27
```

```
calculation_assignment_wasi.py X
C:\Users\Acer\Documents\source_code\Class Materials Week 11> calculation_assignment_wasi.py > ...
28 # Calculate the total price. This will be derived from your selection (Book category, Packs).
29 total_price = (prices[book_type] * packs)
30
31 # To insert your Data into your database, for this example, you have 3 attributes. (2 Attributes from your selection (Package, Pack) and 1 attribute from the database (Days Late))
32 sql = "INSERT INTO user (Book_Type, Book_Pack, Days_Late, Book_Price) VALUES (%s, %s, %s, %s)"
33 val = (book_type, packs, days_late, total_price)
34 mycursor.execute(sql, val)
35 mydb.commit()
36
37 # Calculate fine for late return
38 fine_rate = 2 # RM2 per day
39 late_return_fine = fine_rate * days_late
40
41 # To Print back the output. It will happen in the function collect_data(). The f before the string indicates an f-string in Python.
42 output_label.config(text=f"Book Type: {book_type}\nPacks: {packs}\nTotal Price: RM{total_price}\nLate Return Fine: RM{late_return_fine}")
43
44 # Your Main window, You need to have the title, geometry (MUST)
45 root = tk.Tk()
46 root.title("Book Price Calculator")
47 root.geometry('800x800')
48 root.configure(bg='#c1b8a3')
49
50 # Page Title
51 title_label = tk.Label(root, text='Calculate Your Book Price', font=("Bodoni MT Black", 18, "bold"), bg='#b6897a')
52 title_label.pack(pady=20)
```


```
calculation_assignment_wasi.py X
C:\Users\Acer\Documents\source_code\Class Materials Week 11> calculation_assignment_wasi.py > ...
54 # Frame for the content
55 frame = tk.Frame(root, bg='#E0D8B0')
56 frame.pack()
57
58 # Prices List using a textbox
59 prices_text = tk.Text(frame, height=10, width=50, font=("Times New Roman", 12), bg='#FCFFE7')
60 prices_text.pack(pady=10)
61
62 # The defined list using the pricebox
63 prices_text.insert(tk.END, "Book Types & Prices:\n\n")
64 prices_text.insert(tk.END, "Journal:\nPrice: RM20\n\n")
65 prices_text.insert(tk.END, "Encyclopedia:\nPrice: RM35\n\n")
66 prices_text.insert(tk.END, "Special Book:\nPrice: RM60\n\n")
67 prices_text.config(state='disabled')
68
69 # Book category Dropdown (Label)
70 book_type_label = tk.Label(frame, text="Choose Your Book Types", font=("Bodoni MT Black", 12), bg='#FCFFE7')
71 book_type_label.pack()
72
73 # Book category Dropdown
74 book_type_var = tk.StringVar(root)
75 book_type_var.set("Select Your Book Types") # Default value before your selection
76 book_type_dropdown = tk.OptionMenu(frame, book_type_var, "Journal", "Encyclopedia", "Special Book")
77 book_type_dropdown.config(font=("Times New Roman", 12))
78 book_type_dropdown.pack()
```

```
calculation_assignment_wasi.py X
C: > Users > Acer > Documents > source_code > Class Materials Week 11 > calculation_assignment_wasi.py > ...

80 # Packs Entry. Label and user can insert data through entry
81 packs_label = tk.Label(frame, text="Packs:", font=("Times New Roman", 12, "bold"), bg='#b6897a')
82 packs_label.pack()
83 packs_entry = tk.Entry(frame, font=("Times New Roman", 12), bg='FFEB1')
84 packs_entry.pack()
85
86 # Days Late Entry. Label and user can insert data through entry
87 days_late_label = tk.Label(frame, text="Days Late:", font=("Times New Roman", 12, "bold"), bg='#b6897a')
88 days_late_label.pack()
89 days_late_entry = tk.Entry(frame, font=("Times New Roman", 12), bg='FFEB1')
90 days_late_entry.pack()
91
92 # Save Button
93 save_button = tk.Button(root, text="Calculate Book Price", command=collect_data, font=("Bodoni MT Black", 12, "bold"), bg='#E8C07D', fg='bl
94 save_button.pack(pady=20)
95
96 # Output Label & result
97 output_label = tk.Label(root, text="Total", font=("Bodoni MT Black", 12, "bold"), bg='#a36370')
98 output_label.pack()
99
100 root.mainloop()
101
```


6.0 SNAPSHOT OF PROJECT (GUI)

6.1 GUI User Registration

 User Register

USER REGISTRATION

First Name

Last Name

Email

Password

Gender

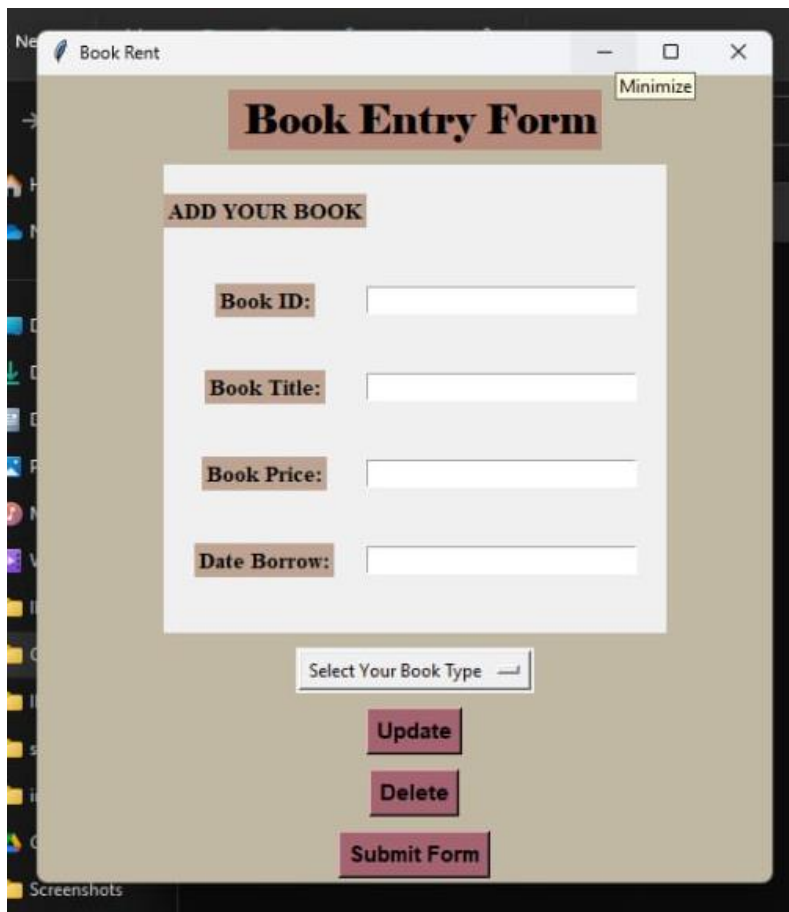
Date of Birth

2024-01-17

▼

SUBMIT

6.2 GUI Book Entry



The screenshot shows a web browser window titled "Book Rent" displaying a "Book Entry Form". The form is titled "ADD YOUR BOOK" and contains four input fields: "Book ID:", "Book Title:", "Book Price:", and "Date Borrow:". Below these fields is a dropdown menu labeled "Select Your Book Type". At the bottom of the form are three buttons: "Update", "Delete", and "Submit Form". The window has standard minimize, maximize, and close buttons in the top right corner.

Book Rent

Book Entry Form

ADD YOUR BOOK

Book ID:

Book Title:

Book Price:

Date Borrow:

Select Your Book Type

Update

Delete

Submit Form

6.3 GUI Calculation of book

Book Price Calculator

Calculate Your Book Price

Book Types & Prices:

Journal:
Price: RM20

Encyclopedia:
Price: RM35

Special Book:
Price: RM60

Choose Your Book Types

Special Book

Packs:

5

Days Late:

2

Calculate Book Price

Book Type: Special Book
Packs: 5
Total Price: RM300
Late Return Fine: RM4

7.0 SNAPSHOT OF DATABASE (XAMPP)

7.1 Database (XAMPP) User Registration

Server: 127.0.0.1 » Database: register » Table: user_registration

Browse Structure SQL Search Insert Export Import Privileges Open

⚠ Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

✓ Showing rows 0 - 3 (4 total, Query took 0.0003 seconds.)

```
SELECT * FROM `user_registration`
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Extra options

First_Name	Last_Name	User_Email	User_Password	User_Gender	Date_of_Birth
Amin	Latip	aminn@gmail.com.my	amin1267	Male	2004-03-17
Amin	Latip	aminn@gamil.com.my	amin1267	Male	2004-03-17
Nick	Lee	nickk@gmail.com.my	nicki1200	Male	2003-01-21
Nadia	Maisarah	nadiaa@gmail.com.my	nadinn80	Female	2002-04-12

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Server: 127.0.0.1 » Database: register » Table: user_registration

Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers

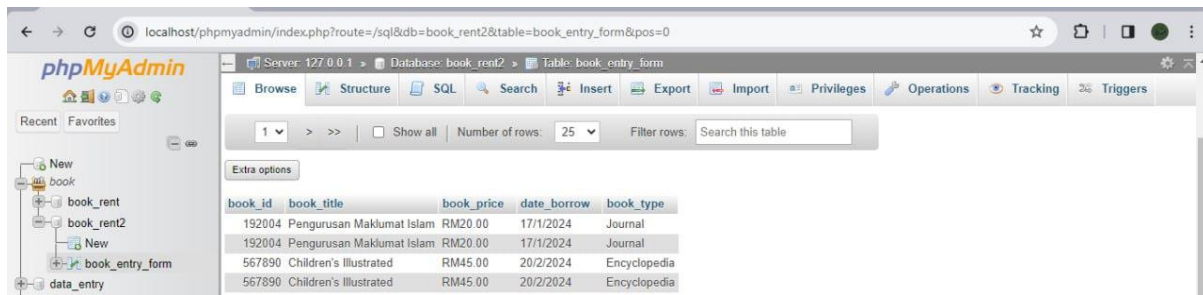
Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	First_Name	text	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 2	Last_Name	text	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 3	User_Email	varchar(30)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 4	User_Password	varchar(20)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 5	User_Gender	varchar(7)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 6	Date_of_Birth	date			No	None			Change Drop More

☐ Check all With selected: Browse Change Drop Primary Unique Index Spatial Fulltext Add to central columns Remove from central columns



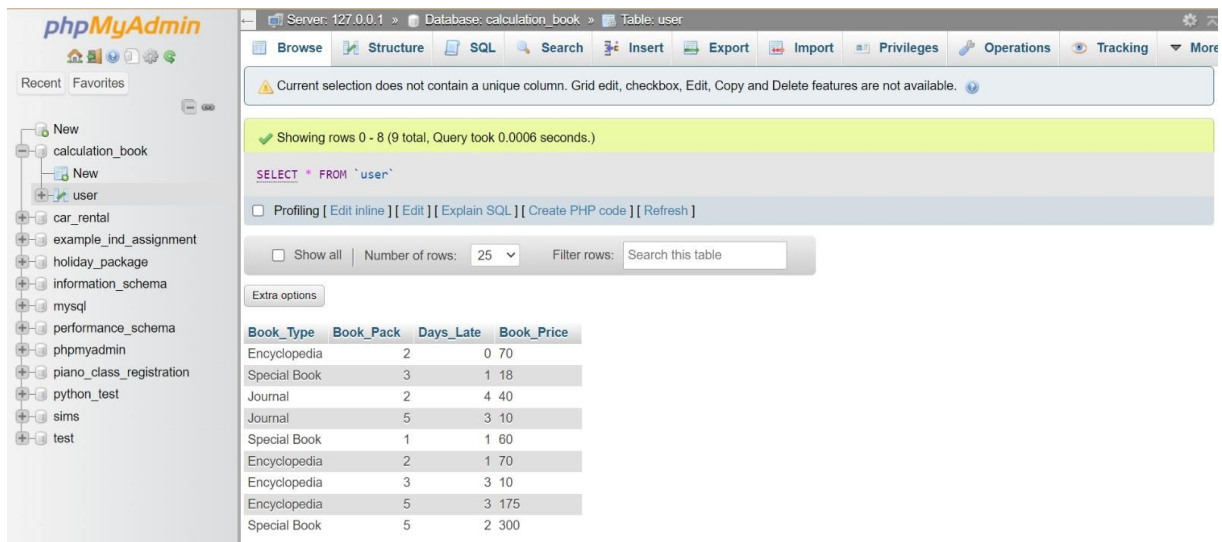
7.2 Database (XAMPP) Book Entry



The screenshot shows the phpMyAdmin web interface. The left sidebar displays the database structure with 'book_rent2' selected. The main panel shows the 'book_entry_form' table with the following data:

book_id	book_title	book_price	date_borrow	book_type
192004	Pengurusan Maklumat Islam	RM20.00	17/1/2024	Journal
192004	Pengurusan Maklumat Islam	RM20.00	17/1/2024	Journal
567890	Children's Illustrated	RM45.00	20/2/2024	Encyclopedia
567890	Children's Illustrated	RM45.00	20/2/2024	Encyclopedia

7.3 Database (XAMPP) Calculation of book



Server: 127.0.0.1 » Database: calculation_book » Table: user

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Showing rows 0 - 8 (9 total, Query took 0.0006 seconds.)

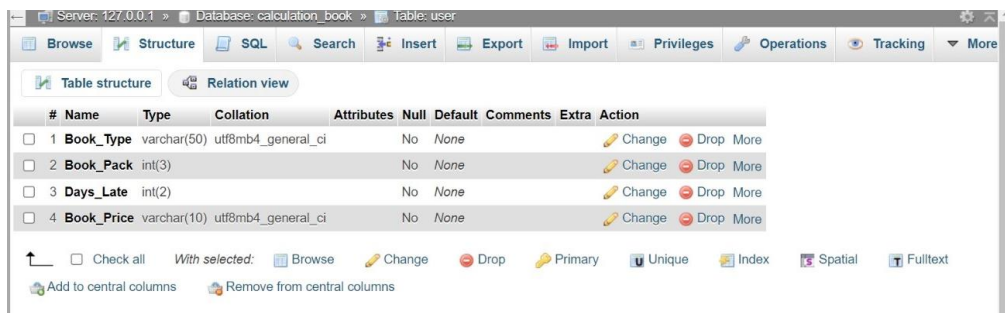
```
SELECT * FROM `user`
```

☐ Profiling [[Edit inline](#)] [[Edit](#)] [[Explain SQL](#)] [[Create PHP code](#)] [[Refresh](#)]

☐ Show all | Number of rows: 25 | Filter rows:

Extra options

Book_Type	Book_Pack	Days_Late	Book_Price
Encyclopedia	2	0	70
Special Book	3	1	18
Journal	2	4	40
Journal	5	3	10
Special Book	1	1	60
Encyclopedia	2	1	70
Encyclopedia	3	3	10
Encyclopedia	5	3	175
Special Book	5	2	300



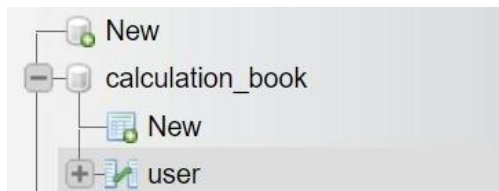
Server: 127.0.0.1 » Database: calculation_book » Table: user

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1	Book_Type	varchar(50)	utf8mb4_general_ci	No	None			Change Drop More
<input type="checkbox"/>	2	Book_Pack	int(3)		No	None			Change Drop More
<input type="checkbox"/>	3	Days_Late	int(2)		No	None			Change Drop More
<input type="checkbox"/>	4	Book_Price	varchar(10)	utf8mb4_general_ci	No	None			Change Drop More

☐ Check all | With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Spatial](#) [Fulltext](#)

[Add to central columns](#) [Remove from central columns](#)



New

calculation_book

New

user

8.0 CONCLUSION

The purpose of the rental book code system is to manage the book rentals in a bookstore or library. Users can go through the books that are offered, rent, return, and see their rental history.

The system is made up of various essential parts such as book class, user class, library class and main application. Book class can holds information on a book, including its title, author, genre, and availability. It also contains ways to show book details and adjust the availability status. Other than that, user class can holds information about a user, including name, ID, and renting history. It provides instructions on how to check rental history and return and rent books. Besides, library class oversees the entire system of rentals. It keeps track of a list of registered users, a list of books that are available, and a list of books that are rented. It provides tools for managing book rents and returns, adding books, registering users, and producing reports on past rentals. Lastly, main application offers a user interface through which users can interact with the system and makes use of the Library class. Options to peruse books, look up specific books, rent, return, and view rental history are possible.

Additional features like user identification, fine computation for overdue books, and book reservations can improve the system even more. All things considered, the rental book code system streamlines the management of book rentals, increasing its effectiveness and convenience for patrons as well as library employees.