

## **LIBRARY MANAGEMENT SYSTEM**

-----

### **AIM:**

To develop an application for managing Book Details, borrowing and returning books and insisting about fines.

### **PROCEDURE:**

#### **DISPLAY**

- As a part of display, the books which is being added in the mysql database namely librarymanagement in the table called booksinfo, has been show in the page
- The books which are available in this page has been organized through JTable with the attributes namely Book\_No, Book\_Name, Quantity and shelf\_No

#### **BORROW**

- In Borrow Page, their account number, username, book\_no and date where they borrowed the book has been got from the GUI Page.
- Then through SQL Queries, in the table called Borrow, the details of the borrower has been added.
- The bookinfo table has been updated by decreasing the Quantity by 1 since the book has been taken by the customer and the message is given that they have to return the book within 5 days.

#### **RETURN**

- In Return Page, their account number, username, book\_no and date where they returned the book has been got from the GUI Page.
- Then through SQL Queries, in the table called returninfo, the details has been added.
- Then the date when they borrowed the book and returned the book has been taken and evaluated. If the difference is less than or equal to 5, then the customer do not want to pay the fine. If the difference is greater than 5, then for each day the fine amount is rs 5 and it is shown in the dialog box.

- The bookinfo table has been updated by increasing the Quantity by 1 since the book has been returned by the customer.

#### **PLATFORMS USED:**

- MYSQL Command Client for Database
- Eclipse IDE for Java GUI and front end and back end Connection.

#### **CODE:**

#### **HOME PAGE:**

```
package librarymanagementsystem;

import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
import javax.swing.event.*;

public class LibraryManagementSystem extends JFrame implements
ActionListener {

JLabel
L,L1,L2,L3,L4,L5,L6,L7,L8,L9,L10,L11,L12,L13,L14,L15,L18,L19,L20,L21,L
22,L23,L24,L25,L26;

JButton Display,Borrow,Return,Update;

JTextField t1,t2,t3,t4,t5,t6,t7,t8,t9,t10,t11,t12,t13;

JFrame jfr,jfr1,jfr2;

public LibraryManagementSystem() {

setVisible(true);

setSize(2000, 2000);

setLayout(null);

setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

setTitle("LIBRARY MANAGEMENT SYSTEM");

getContentPane().setBackground(Color.CYAN);

L = new JLabel("LIBRARY MANAGEMENT SYSTEM",JLabel.CENTER);
```

```
L.setForeground(Color.red);
L.setBounds(650,20,500,100);
L.setFont(new Font("Consolas",Font.BOLD,30));
//
L1 = new JLabel("CHOOSE YOUR OPTION --->",JLabel.CENTER);
L1.setBounds(700,50,500,100);
L1.setFont(new Font("Consolas",Font.BOLD,26));
L1.setForeground(Color.red);
//
L2 =new JLabel("DISPLAY ALL THE BOOKS:");
L2.setBounds(400,200,500,100);
L2.setFont(new Font("Consolas",Font.BOLD,20));
L2.setForeground(Color.red);
//
L3 =new JLabel("BORROW A BOOK:");
L3.setBounds(400,300,500,100);
L3.setFont(new Font("Consolas",Font.BOLD,20));
L3.setForeground(Color.red);
//
L4 = new JLabel("RETURN A BOOK:");
L4.setBounds(400,400,500,100);
L4.setFont(new Font("Consolas",Font.BOLD,20));
L4.setForeground(Color.red);
//
Display = new JButton("DISPLAY");
Display.setBounds(800,215,100,50);
//
Borrow = new JButton("BORROW");
```

```

    Borrow.setBounds(750,320,100,50);
    //
    Return = new JButton("RETURN");
    Return.setBounds(700,420,100,50);
    //

    // ADDING ALL IN THE FRAME GUI
    add(L);
    add(L1);
    add(L2);
    add(L3);
    add(L4);

    add(Display);
    add(Borrow);

    add(Return);

    Display.addActionListener((ActionListener) this);
    Borrow.addActionListener((ActionListener) this);
    Return.addActionListener((ActionListener) this);
}

public void actionPerformed(ActionEvent e) {
    Object obj = e.getSource();

```

```

        if(obj == Display) {
            Display d = new Display();
            d.DisplayBooks();
        }
        else if(obj == Borrow) {
            Borrow b = new Borrow();
            b.borrowbooks();
        }
        else if(obj == Return) {
            Return r = new Return();
            r.Returnbooks();
        }
    }
}

```

```

public static void main(String[] args) {
    new LibraryManagementSystem();
}

```

```

}

```

#### **DISPLAY:**

```

package librarymanagementsystem;
import java.sql.*;
import java.util.logging.Level;
import java.util.logging.Logger;
import java.awt.*;
import javax.swing.*;
import javax.swing.table.DefaultTableModel;

```

```

public class Display {
public void DisplayBooks() {
String cols[] = {"Book No","Book Name","Quantity","Shelf_No"};

    JTable jt= new JTable();
    jt.setFont(new Font("Arial",Font.PLAIN,10));
    DefaultTableModel model = new DefaultTableModel();
    jt.setModel(model);
    model.setColumnIdentifiers(cols);
    JFrame jf = new JFrame();
    jf.setVisible(true);
    jf.setLayout(null);
    jf.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    jf.setSize(2000,2000);
    jf.setTitle("RECORDS");
    jf.setBackground(Color.cyan);
    JLabel L6 = new JLabel("DISPLAYING ALL THE BOOKS");
    L6.setBounds(650,20,500,100);
    L6.setForeground(Color.red);
    L6.setFont(new Font("Consolas",Font.BOLD,18));
    jf.add(L6);

try {
    Class.forName("com.mysql.cj.jdbc.Driver");

    Connection
con=DriverManager.getConnection("jdbc:mysql://localhost:3306/libraryman
agement","root","branch-1");

    Statement stmt=con.createStatement();

    ResultSet rs1 =stmt.executeQuery("SELECT * FROM booksinfo");
    while(rs1.next()) {

```

```

        String Book_No = Integer.toString(rs1.getInt("Book_No"));
        String Book_Name = rs1.getString("Book_Name");
        String Quantity=
Integer.toString(rs1.getInt("Quantity"));
        String Shelf_No = rs1.getString("shelf_no");
        model.addRow(new
Object[] {Book_No,Book_Name,Quantity,Shelf_No});
    }
}
catch(Exception ex) {

Logger.getLogger(LibraryManagementSystem.class.getName()).log(Level.SEVERE, null, ex);

}

jt.setBounds(200,100, 1000, 1000);
    JScrollPane sp = new JScrollPane(jt);

sp.setHorizontalScrollBarPolicy(JScrollPane.HORIZONTAL_SCROLLBAR_AS_NEEDED);

sp.setVerticalScrollBarPolicy(JScrollPane.VERTICAL_SCROLLBAR_AS_NEEDED);

    jf.add(sp);
    jf.add(jt);

}
}

```

#### **BORROW:**

```

package librarymanagementsystem;
import java.awt.*;
import java.awt.event.ActionEvent;

```

```

import java.awt.event.ActionListener;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.Statement;
import javax.swing.*;
@SuppressWarnings("serial")
public class Borrow extends JFrame implements ActionListener{
    JButton Borrow;
    JFrame jf1;
    JLabel head,l,l1,l2,l3,l4;
    JTextField t1,t2,t3,t4,t5,t6;
    public void borrowbooks() {
        jf1 = new JFrame();
        jf1.setVisible(true);
        jf1.getContentPane().setBackground(Color.CYAN);
        jf1.setLayout(null);
        jf1.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        jf1.setSize(2000,2000);
        head = new JLabel("BORROW PAGE >>>>>");
        head.setBounds(650,2,500,100);
        head.setForeground(Color.RED);
        head.setFont(new Font("Consolas",Font.BOLD,30));
        //
        jf1.add(head);
        //
        l2 = new JLabel("Name:");

```



```
l2.setBounds(200,50,200,100);
jf1.add(l2);
//
t2 = new JTextField();
t2.setBounds(400,75,300,30);
jf1.add(t2);
//
l3 = new JLabel("Account No:");
l3.setBounds(200,100,200,100);
jf1.add(l3);
//
t3 = new JTextField();
t3.setBounds(400,130,300,30);
jf1.add(t3);
//
l = new JLabel("Book No:");
l.setBounds(200,150,200,100);
jf1.add(l);
//
t1 = new JTextField();
t1.setBounds(400,190,200,30);
jf1.add(t1);
//
l1 = new JLabel("Date issued:");
l1.setBounds(200,275,200,100);
jf1.add(l1);
//
t5 = new JTextField();
```

```

        t5.setBounds(400,310,200,30);
        jf1.add(t5);
        //
        Borrow = new JButton("Borrow");
        Borrow.setBounds(600,500,200,50);
        jf1.add(Borrow);
        Borrow.addActionListener(this);
        //
    }

    public void actionPerformed(ActionEvent e) {
        Object obj = e.getSource();
        if(obj == Borrow) {
            try {
                Class.forName("com.mysql.cj.jdbc.Driver");
                Connection
                con=DriverManager.getConnection("jdbc:mysql://localhost:3306/libraryma
                nagement","root","branch-1");

                Statement stmt=con.createStatement();

                PreparedStatement pstmt = con.prepareStatement("INSERT INTO
                borrow VALUES(?,?,?,?)");

                String acc_no = t3.getText();
                pstmt.setInt(1, Integer.valueOf(acc_no));

                String user_name = t2.getText();
                pstmt.setString(2, user_name);

                String book_no = t1.getText();

```

```

        pstmt.setInt(3,Integer.valueOf(book_no));
        String date = t5.getText();
        pstmt.setInt(4, Integer.valueOf(date));
        PreparedStatement pstmt1 = con.prepareStatement("SELECT * FROM
booksinfo WHERE Book_No = ?");
        pstmt1.setInt(1, Integer.valueOf(book_no));
        ResultSet rs = pstmt1.executeQuery();
        while(rs.next()) {
            String book_name = rs.getString("Book_Name");
            String message = book_name + " has been borrowed
Successfully.!Alert that you have to return the book within 5 days";
            JOptionPane.showMessageDialog(jf1,message);
            PreparedStatement pstmt2 = con.prepareStatement("Update
booksinfo set Quantity = ? where Book_No = ?");
            pstmt2.setString(2,book_no);
            int qty = rs.getInt("Quantity");
            pstmt2.setInt(1,qty-1);
            pstmt2.executeUpdate();
        }

        pstmt.executeUpdate();
    } catch (Exception e1) {
        // TODO Auto-generated catch block
        e1.printStackTrace();
    }
}

```

```
}  
}
```

### **RETURN :**

```
package librarymanagementsystem;
```

```
import java.awt.Color;  
import java.awt.Font;  
import java.awt.event.*;  
import java.sql.Connection;  
import java.sql.DriverManager;  
import java.sql.PreparedStatement;  
import java.sql.ResultSet;  
import java.sql.Statement;
```

```
import javax.swing.*;
```

```
public class Return extends JFrame implements ActionListener {  
    JButton Return;  
    JFrame jf2;  
    JLabel head,l,l1,l2,l3,l4;  
    JTextField t1,t2,t3,t4,t5,t6;  
    public void Returnbooks() {  
        jf2 = new JFrame();  
        jf2.setVisible(true);  
        jf2.getContentPane().setBackground(Color.CYAN);  
        jf2.setLayout(null);  
        jf2.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);  
        jf2.setSize(2000,2000);  
    }  
}
```

```
head = new JLabel("RETURN PAGE >>>>>");
head.setBounds(650,2,500,100);
head.setForeground(Color.RED);
head.setFont(new Font("Consolas",Font.BOLD,30));
//
jf2.add(head);
//
l2 = new JLabel("Name:");
l2.setBounds(200,50,200,100);
jf2.add(l2);
//
t2 = new JTextField();
t2.setBounds(400,75,300,30);
jf2.add(t2);
//
l3 = new JLabel("Account No:");
l3.setBounds(200,100,200,100);
jf2.add(l3);
//
t3 = new JTextField();
t3.setBounds(400,130,300,30);
jf2.add(t3);
//
l1 = new JLabel("Book No:");
l1.setBounds(200,150,200,100);
jf2.add(l1);
//
t1 = new JTextField();
```

```

        t1.setBounds(400,190,200,30);
        jf2.add(t1);
        //
        l1 = new JLabel("Date return:");
        l1.setBounds(200,275,200,100);
        jf2.add(l1);
        //
        t5 = new JTextField();
        t5.setBounds(400,310,200,30);
        jf2.add(t5);
        //

        //
        Return = new JButton("Return");
        Return.setBounds(600,500,200,50);
        jf2.add(Return);
        Return.addActionListener(this);
        //

    }

```

```

@Override
public void actionPerformed(ActionEvent e) {
    Object obj = e.getSource();
    if(obj == Return) {
        try {

```

```

Class.forName("com.mysql.cj.jdbc.Driver");

Connection
con=DriverManager.getConnection("jdbc:mysql://localhost:3306/libraryma
nagement","root","branch-1");

        Statement stmt=con.createStatement();

        PreparedStatement pstmt = con.prepareStatement("INSERT INTO
returninfo VALUES(?,?,?,?)");

        String acc_no = t3.getText();
        pstmt.setInt(1,Integer.valueOf(acc_no));
        String name = t2.getText();
        pstmt.setString(2, name);
        String Book_no = t1.getText();
        int no = Integer.valueOf(Book_no);
        pstmt.setInt(3,Integer.valueOf(Book_no));
        String date = t5.getText();
        int datereturn = Integer.valueOf(date);
        pstmt.setInt(4, Integer.valueOf(date));

        PreparedStatement pstmt2 = con.prepareStatement("SELECT date
FROM borrow WHERE acc_no = ?");
        pstmt2.setInt(1, Integer.valueOf(acc_no));
        ResultSet rs1 = pstmt2.executeQuery();
        while(rs1.next()) {
            int dateborrow = rs1.getInt("date");
            int no_of_days = datereturn-dateborrow;
            if(no_of_days <= 5) {
                String Message = name+" has no fine! Book returned
Successfully";
                JOptionPane.showMessageDialog(jf2,Message);
            }
            else {

```

```

        int fine = no_of_days*5;

        String showmes = name+" has "+ fine+ " Rs fine!
Collect the fine and return the book";

        JOptionPane.showMessageDialog(jf2,showmes);

    }

    pstmt.executeUpdate();

}

    PreparedStatement pstmt4 = con.prepareStatement("SELECT * FROM
booksinfo where Book_No = ?");

    pstmt4.setInt(1,no);

    ResultSet r = pstmt4.executeQuery();

    while(r.next()) {

        PreparedStatement pstmt3 = con.prepareStatement("Update booksinfo
set Quantity = ? where Book_No = ?");

        pstmt3.setString(2,Book_no);

        int qty = r.getInt("Quantity");

        pstmt3.setInt(1,qty+1);

        pstmt3.executeUpdate();

    }

} catch (Exception e1) {

// TODO Auto-generated catch block
e1.printStackTrace();

}

}

```



}

}

### OUTPUT:

```
mysql> desc booksinfo;
```

Field	Type	Null	Key	Default	Extra
Book_No	int	NO	PRI	NULL	
Book_Name	varchar(1000)	YES		NULL	
Quantity	int	YES		NULL	
shelf_no	varchar(1000)	YES		NULL	

```
4 rows in set (0.01 sec)
```

```
mysql> select * from booksinfo;
```

Book_No	Book_Name	Quantity	shelf_no
101	Caesar and Juliet	6	U-1
102	Querying Theory	6	LU-1
103	Database System Concepts	3	LL-1
104	Operating System Overview	3	LU-1
105	Design of Algorithms	5	LU-2
106	Pattern Recognition and Machine Learning	6	SPL-1
107	Data Mining Basics by Kamber	6	SPL-2

```
7 rows in set (0.00 sec)
```

## LIBRARY MANAGEMENT SYSTEM

CHOOSE YOUR OPTION --->

DISPLAY ALL THE BOOKS:

DISPLAY

BORROW A BOOK:

BORROW

RETURN A BOOK:

RETURN

### DISPLAYING ALL THE BOOKS

101	Caesar and Juliet	6	U-1
102	Querying Theory	6	LU-1
103	Database System Concepts	3	LU-1
104	Operating System Overview	3	LU-1
105	Design of Algorithms	5	LU-2
106	Pattern Recognition and Machine Learning	6	SPL-1
107	Data Mining Basics by Kamber	6	SPL-2

```
mysql> desc borrow;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| acc_no | varchar(20) | NO | PRI | NULL | |
| user_name | varchar(20) | YES | | NULL | |
| Book_No | int | YES | MUL | NULL | |
| date | int | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

**BORROW PAGE >>>>>**


Name:

Account No:

Book No:

Date issued:

Message ×

 Caesar and Juliet has been borrowed Successfully.!Alert that you have to return the book within 5 days

```
mysql> select * from borrow;
+-----+-----+-----+-----+
| acc_no | user_name | Book_No | date |
+-----+-----+-----+-----+
| 5072 | Raghul | 101 | 20 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

## RETURN PAGE >>>>>>

Name:

Account No:

Book No:

Date return:

Return

### Message



**Raghul has 40 Rs fine! Collect the fine and return the book**

OK

```
mysql> select * from returninfo;
```

```
+-----+-----+-----+-----+
| acc_no | user_name | Book_No | date |
+-----+-----+-----+-----+
| 5072   | Raghul   | 101     | 28   |
+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

## BORROW PAGE >>>>>

Name:

Account No:

Book No:

Date issued:

Borrow

Message



Querying Theory has been borrowed Successfully.!Alert that you have to return the book within 5 days

OK

## RETURN PAGE >>>>>

Name:

Account No:

Book No:

Date return:

Return

Message



Sundar has no fine! Book returned Successfully

OK

**RESULT:**

The above code to develop an application for library store management has been updated and the output has been obtained.

-----