STUDENT-LIBRARY MANAGEMENT SYSTEM PROJECT

A. book.java file

```
B. package College ;
C.
D. import java.util.Scanner;
E.
F. public class book {
G.     public int sNo ;
H.     public String bookName ;
I.     public String authorName ;
J.     public int bookQty ;
K.     public int bookQtyCopy ;
L.
M.     Scanner input = new Scanner(System.in) ;
N.
O.     public book() {
P.         System.out.println("Enter Serial number of the book:");
Q.         this.sNo = input.nextInt() ;
R.         input.nextLine() ;
S.
T.         System.out.println("Enter the name of the book:");
U.         this.bookName = input.nextLine() ;
V.
W.         System.out.println("Enter the name of the author:");
X.         this.authorName = input.nextLine() ;
Y.
Z.         System.out.println("Enter the quantity of the book:");
AA.        this.bookQty = input.nextInt() ;
AB.        bookQtyCopy = this.bookQty ;
AC.    }
AD.}
```

B. books.java file

```
package College;

import java.util.Scanner;

public class books {
    book myBook[] = new book[100] ;
    public static int count ;

    Scanner input = new Scanner(System.in) ;
```

```java
    // To compare books
    public int compareBookObjects(book b1 , book b2) {
        if (b1.bookName.equalsIgnoreCase(b2.bookName)) {
            System.out.println("Book of this name already exists.");
            return 0 ;
        }
        if (b1.sNo == b2.sNo) {
            System.out.println("Book of this serial number already exists.");
            return 0 ;
        }
        return 1 ;
    }
    // To add books
    public void addBook(book b) {
        for (int i = 0; i < count ; i++) {
            if (this.compareBookObjects(b , this.myBook[i]) == 0) {
                return ;
            }
        }
        if (count < 100) {
            myBook[count] = b ;
            count++ ;
        } else {
            System.out.println("Not enough space to add books.");
        }
    }
    // To search book by its serial number
    public void searchBySno() {
        System.out.println("\t\t\t\tSEARCHING BY SERIAL NUMBER\n");

        int sNO ;
        System.out.println("Enter Serial Number of book:");
        sNO = input.nextInt() ;

        int flag = 0 ;
        System.out.println(
            "S.No\t\tName\t\tAuthor\t\tAvailable Qty\t\tTotal Qty"
        );
        for (int i = 0; i < count; i++) {
            if (sNO == myBook[i].sNo) {
                System.out.println(
                    myBook[i].sNo + "\t\t"
                    + myBook[i].bookName + "\t\t"
                    + myBook[i].authorName + "\t\t"
                    + myBook[i].bookQty + "\t\t"
```

```
                    + myBook[i].bookQtyCopy
                );
                flag++ ;
                return ;
            }
        }
        if (flag == 0) {
            System.out.println("No book for Serial Number " + sNO + " found!!");
        }
    }
    // To search book by its Author's name
    public void searchByAuthorName() {
        System.out.println("\t\t\t\tSEARCHING BY AUTHOR'S NAME\n");
        input.nextLine() ;

        System.out.println("Enter the name of the author:");
        String authorName = input.nextLine();

        int flag = 0 ;

        System.out.println(
            "S.No\t\tName\t\tAuthor\t\tAvailable Qty\t\tTotal Qty"
        );

        for (int i = 0; i < count; i++) {
            if(authorName.equalsIgnoreCase(myBook[i].authorName)){
                System.out.println(
                    myBook[i].sNo + "\t\t"
                    + myBook[i].bookName + "\t\t"
                    + myBook[i].authorName + "\t\t"
                    + myBook[i].bookQty + "\t\t"
                    + myBook[i].bookQtyCopy
                );
                flag++ ;
            }
        }
        if (flag == 0) {
            System.out.println("No Books of " + authorName + " found of!!");
        }
    }
    // To show all books
    public void showAllBooks() {
        System.out.println("\t\t\t\tSHOWING ALL THE BOOKS\n");
        System.out.println(
            "S.No\t\tName\t\tAuthor\t\tAvailable Qty\t\tTotal Qty"
```

```
        );
        for (int i = 0; i < count; i++) {
                System.out.println(
                    myBook[i].sNo + "\t\t"
                    + myBook[i].bookName + "\t\t"
                    + myBook[i].authorName + "\t\t"
                    + myBook[i].bookQty + "\t\t"
                    + myBook[i].bookQtyCopy
                );

        }
    }
    // To edit the book
    public void upgradeBookQty() {
        System.out.println("\t\t\t\tUPGRADE QUANTITY OF A BOOK\n");
        System.out.println("Enter Serial Number of a book:");
        int sNO = input.nextInt() ;

        for (int i = 0; i < count; i++) {
            if (sNO == myBook[i].sNo) {
                System.out.println("Enter number of books to be added:");
                int addingBookQty = input.nextInt() ;

                myBook[i].bookQty += addingBookQty ;
                myBook[i].bookQtyCopy += addingBookQty ;

                return ;
            }
        }

    }
    // To create menu
    public void dispMenu() {
        System.out.println(
            ".................................................................");
        System.out.println("Press 0 to Exit Application.");
        System.out.println("Press 1 to Add new Book.");
        System.out.println("Press 2 to Upgrade Quantity of a Book.");
        System.out.println("Press 3 to Search a Book.");
        System.out.println("Press 4 to Show all Books.");
        System.out.println("Press 5 to Register a Student.");
        System.out.println("Press 6 to Show all Registered Students.");
        System.out.println("Press 7 to Check Out Book.");
        System.out.println("Press 8 to Check in Book. ");
        System.out.println(
```

```
            ".....................................................................");
    }
    // To search the library
    public int isAvailable(int sNo) {
        for (int i = 0; i < count; i++) {
            if (sNo == myBook[i].sNo) {
                if (myBook[i].bookQtyCopy > 0) {
                    System.out.println("Book is Available.");
                    return i ;
                }
                System.out.println("Book is Unavailable.");
                return -1 ;
            }
        }
       System.out.println("No Book of this Serial Number " + sNo + " is
Available");
       return -1 ;
    }
    // To remove the book from the library
    public book checkOutBook() {
        System.out.println("Enter Serial Number of Book to be Checked Out.");
        int sNO = input.nextInt();
        int bookIndex = isAvailable(sNO) ;
        if (bookIndex != -1) {
            myBook[bookIndex].bookQtyCopy-- ;
            return myBook[bookIndex] ;
        }
        return null ;
    }
    public void checkInBook(book b) {
        for (int i = 0; i < count; i++) {
            if (b.equals(myBook[i])) {
                myBook[i].bookQtyCopy++ ;
                return ;
            }
        }
    }
}
```

C. <u>student.java file</u>

```
package College ;

import java.util.Scanner;
```

```
public class student{
    String studentName ;
    String regNumber ;

    book borrowedBooks[] = new book[3] ;
    public int booksCount = 0 ;

    Scanner input = new Scanner(System.in) ;

    public student(){
        System.out.println("Enter the Student Name :");
        this.studentName = input.nextLine() ;

        System.out.println("Enter the Registration Number :");
        this.regNumber = input.nextLine() ;
    }
}
```

D. students.java file

```
package College;

import java.util.Scanner;

public class students {
    Scanner input = new Scanner(System.in);
    student theStudents[] = new student[100];
    public static int count = 0;

    // To add students
    public void addStudent(student s) {
        for (int i = 0; i < count; i++) {
            if (s.regNumber.equalsIgnoreCase(theStudents[i].regNumber)) {
                System.out.println("Student of Registration Number " +
s.regNumber + " is alredy registered.");
                return;
            }
        }
        if (count <= 100) {
            theStudents[count] = s;
            count++;
        }
    }
```

```
    // Displaying all the students
    public void displayStudent() {
        System.out.println("Student Name\tReg Num");
        for (int i = 0; i < count; i++) {
            System.out.println(theStudents[i].studentName + "\t\t" +
theStudents[i].regNumber);
        }
    }

    // To check stsudent
    public int isStudent() {
        System.out.println("Enter Registration Number:");
        String regNumber = input.nextLine();
        for (int i = 0; i < count; i++) {
            if (theStudents[i].regNumber.equalsIgnoreCase(regNumber)) {
                return i;
            }
        }
        System.out.println("Student is not Registered.");
        System.out.println("Get Registered first.");
        return -1;
    }

    // To remove the book
    public void checkOutBook(books book) {
        int studentIndex = this.isStudent();
        if (studentIndex != -1) {
            System.out.println("checking out");

            book.showAllBooks();
            book b = book.checkOutBook();

            System.out.println("checking out");
            if (b != null) {
                if (theStudents[studentIndex].booksCount <= 3) {
                    System.out.println("adding book");
                    theStudents[studentIndex].borrowedBooks[theStudents[studentIn
dex].booksCount] = b;
                    theStudents[studentIndex].booksCount++;

                    return;
                } else {
                    System.out.println("Student can't borrow more than 3 books.");
                    return;
```

```
                }
            }
            System.out.println("Book is not Available.");
        }
    }

    // To add the book
    public void checkInBook(books book) {
        int studentIndex = this.isStudent();
        if (studentIndex != -1) {
            System.out.println(
                    "S.No\t\t\tBook Name\t\t\tAuthor Name");

            student s = theStudents[studentIndex];

            for (int i = 0; i < s.booksCount; i++) {
                System.out.println(
                        s.borrowedBooks[i].sNo + "\t\t\t"
                                + s.borrowedBooks[i].bookName + "\t\t\t"
                                + s.borrowedBooks[i].authorName);
            }
            // Display Message only
            System.out.println("Enter Serial Number of Books to be Checked In");
            int sNo = input.nextInt();
            for (int i = 0; i < s.booksCount; i++) {
                if (sNo == s.borrowedBooks[i].sNo) {
                    book.checkInBook(s.borrowedBooks[i]);
                    s.borrowedBooks[i] = null;

                    return;
                }
            }
            System.out.println("Book of this Serial Number " + sNo + " not
found");
        }
    }
}
```

E. Library.java file

```
package College;

import java.util.Scanner;
```

```
public class Library {
    public static void main(String[] args) {

        Scanner input = new Scanner(System.in) ;

        System.out.println("***********Welcome to Amit's Library***********");
        System.out.println("            Select from the following options:"   );
        System.out.println("*********************************************");

        // creating object of books class
        books ob = new books();
        //creating object of students class
        students obstudents = new students() ;

        int choice ;
        int searchChoice ;

        do {
            ob.dispMenu();
            choice = input.nextInt() ;

            //switch case
            switch (choice) {
                case 1:
                    book b = new book() ;
                    ob.addBook(b);
                    break;

                case 2:
                    ob.upgradeBookQty();
                    break ;

                case 3:
                    System.out.println("Press 1 to Search with Book Serial No.");
                    System.out.println("Press 2 to Search with Book's Author's
Name.");
                    searchChoice = input.nextInt() ;

                    //nested switch case
                    switch (searchChoice) {
                        case 1:
                            ob.searchBySno();
                            break;
                        case 2:
                            ob.searchByAuthorName();
```

```
                    }
                    break ;

                case 4:
                    ob.showAllBooks();
                    break ;

                case 5:
                    student s = new student() ;
                    obstudents.addStudent(s);
                    break ;

                case 6:
                    obstudents.displayStudent();
                    break ;

                case 7:
                    obstudents.checkOutBook(ob);
                    break ;

                case 8:
                    obstudents.checkInBook(ob);
                    break ;

                default:
                    System.out.println("ENTER BETWEEN 0 TO 8.");
            }
        } while (choice != 0);
    }
}
```

OUTPUT

----------Configuration: <Default>----------

**********Welcome to Amit's Library**********

Select from the following options:

****

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

1

Enter Serial number of the book:

20

Enter the name of the book:

JAVA

Enter the name of the author:

James Gosling

Enter the quantity of the book:

30

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

1

Enter Serial number of the book:

15

Enter the name of the book:

C++

Enter the name of the author:

Amit Lakhera

Enter the quantity of the book:

20

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

1

Enter Serial number of the book:

10

Enter the name of the book:

C

Enter the name of the author:

Dennis Ritchie

Enter the quantity of the book:

15

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

2

UPGRADE QUANTITY OF A BOOK

Enter Serial Number of a book:

10

Enter number of books to be added:

15

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

3

Press 1 to Search with Book Serial No.

Press 2 to Search with Book's Author's Name.

2

SEARCHING BY AUTHOR'S NAME

Enter the name of the author:

Amit Lakhera

S.No	Name	Author	Available Qty	Total Qty
15	C++	Amit Lakhera	20	20

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

4

SHOWING ALL THE BOOKS

S.No	Name	Author	Available Qty	Total Qty
20	JAVA	James Gosling	30	30
15	C++	Amit Lakhera	20	20
10	C	Dennis Ritchie	30	30

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

5

Enter the Student Name :

Adam Zampa

Enter the Registration Number :

2101504

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

5

Enter the Student Name :

Dravid Warner

Enter the Registration Number :

2101505

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

6

Student Name Reg Num

Adam Zampa 2101504

Dravid Warner 2101505

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

7

Enter Registration Number:

2101505

checking out

SHOWING ALL THE BOOKS

S.No	Name	Author	Available Qty	Total Qty
20	JAVA	James Gosling	30	30
15	C++	Amit Lakhera	20	20
10	C	Dennis Ritchie	30	30

Enter Serial Number of Book to be Checked Out.

10

Book is Available.

checking out

adding book

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

.....

8

Enter Registration Number:

2101505

S.No	Book Name	Author Name
10	C	Dennis Ritchie

Enter Serial Number of Books to be Checked In

5

Book of this Serial Number 5 not found

.....

Press 0 to Exit Application.

Press 1 to Add new Book.

Press 2 to Upgrade Quantity of a Book.

Press 3 to Search a Book.

Press 4 to Show all Books.

Press 5 to Register a Student.

Press 6 to Show all Registered Students.

Press 7 to Check Out Book.

Press 8 to Check in Book.

……………………………………………………………

Process interrupted by user.