**CODE :**

**Mangement\_Sys.java :**

import java.util.ArrayList;

import java.util.Scanner;

public class Management\_Sys extends Student

{

// Lists and Variables

private static ArrayList<Student> students = new ArrayList<>();

private static Scanner scanner = new Scanner(System.in);

public static int total\_books = 5;

private static int total\_students = 0;

private static String password = "mcs@123";

// Main Function

public static void main(String[] args)

{

Book.store\_book();

int option;

while(true)

{

System.out.println();

System.out.println("---> LIBRARY MANAGEMENT SYSTEM <---");

System.out.println("1) Student Record Management");

System.out.println("2) Book Record Management");

System.out.println("3) Library");

System.out.println("4) Exit");

System.out.println();

System.out.print("Enter Desired Operation (INDEX) : ");

option = scanner.nextInt();

if(option == 1)

student\_management();

else if(option == 2)

book\_management();

else if(option == 3)

Library();

else if(option == 4)

break;

}

System.out.println("EXITING");

}

// Functioning Methods

private static void add\_student()

{

Student student = new Student();

students.add(student);

System.out.println("Student created successfully");

total\_students += 1;

}

public static void delete\_student()

{

int found = 0;

int roll\_num;

System.out.println();

System.out.print("Enter ROLL-NUMBER to search : ");

roll\_num = scanner.nextInt();

for(Student student : students)

{

if(student.get\_rollnum() == roll\_num)

{

found = 1;

students.remove(student);

System.out.println("STUDENT REMOVED SUCCESSFULLY");

break;

}

}

if(found == 0)

System.out.println("Roll Number not found, TRY AGAIN");

}

public static void update\_student()

{

int found = 0;

int roll\_num;

System.out.println();

System.out.print("Enter ROLL-NUMBER to search : ");

roll\_num = scanner.nextInt();

for(Student student : students)

{

if(student.get\_rollnum() == roll\_num)

{

found = 1;

student.Update();

break;

}

}

if(found == 0)

System.out.println("Roll Number not found, TRY AGAIN");

}

public static void add\_book()

{

Scanner scanner\_add\_book = new Scanner(System.in);

String name;

int time\_limit;

System.out.println();

System.out.print("Enter Name of Book : ");

name = scanner\_add\_book.nextLine();

System.out.print("Enter Issue Limit for the Book : ");

time\_limit = scanner\_add\_book.nextInt();

System.out.println("BOOK SUCCESSFULLY ADDED");

Book.books\_store.put(name , time\_limit);

Book.available\_books.add(name);

total\_books += 1;

}

public static void delete\_book()

{

Scanner scanner\_book\_delete = new Scanner(System.in);

int found\_in\_store = 0;

int found\_in\_available = 0;

String name;

System.out.println();

System.out.print("Enter Book to search : ");

name = scanner\_book\_delete.nextLine();

for(String book : Book.books\_store.keySet())

{

if( (book).equals(name) )

found\_in\_store = 1;

}

for(String book : Book.available\_books)

{

if( (book).equals(name) )

found\_in\_available = 1;

}

if(found\_in\_store == 1 && found\_in\_available == 1)

{

System.out.println("BOOK DELETED SUCCESSFULLY");

Book.books\_store.remove(name);

Book.available\_books.remove(name);

total\_books -= 1;

}

else if(found\_in\_store == 1 && found\_in\_available == 0)

{

System.out.println("BOOK IS CURRENTLY ISSUED");

}

else if(found\_in\_store == 0)

{

System.out.println("BOOK DOES NOT EXIST");

}

}

public static void update\_book()

{

Scanner scanner\_book\_update = new Scanner(System.in);

int found\_in\_store = 0;

int found\_in\_available = 0;

String name;

System.out.println();

System.out.print("Enter Book to search : ");

name = scanner\_book\_update.nextLine();

for(String book : Book.books\_store.keySet())

{

if( (book).equals(name) )

found\_in\_store = 1;

}

for(String book : Book.available\_books)

{

if( (book).equals(name) )

found\_in\_available = 1;

}

if(found\_in\_store == 1 && found\_in\_available == 1)

{

String new\_name;

int new\_time\_limit;

System.out.print("Enter New Name : ");

new\_name = scanner\_book\_update.nextLine();

System.out.print("Enter New Time Limit : ");

new\_time\_limit = scanner\_book\_update.nextInt();

Book.books\_store.remove(name);

Book.available\_books.remove(name);

Book.books\_store.put(new\_name , new\_time\_limit);

Book.available\_books.add(new\_name);

}

else if(found\_in\_store == 1 && found\_in\_available == 0)

{

System.out.println("BOOK IS CURRENTLY ISSUED");

}

else if(found\_in\_store == 0)

{

System.out.println("BOOK DOES NOT EXIST");

}

}

public static void student\_management()

{

int option;

int pass\_status = get\_pass();

if(pass\_status == 1)

{

while(true)

{

System.out.println();

System.out.println("---> INFO <---");

System.out.println("Total Students : "+total\_students);

System.out.println();

System.out.println("1) Add Student");

System.out.println("2) Delete Student");

System.out.println("3) Update Student");

System.out.println("4) Go to Home Page");

System.out.println();

System.out.print("Enter Desired Operation (INDEX) : ");

option = scanner.nextInt();

if(option == 1)

add\_student();

else if(option == 2)

delete\_student();

else if(option == 3)

update\_student();

else if(option == 4)

break;

}

System.out.println("EXITING");

}

else

{

System.out.println("WRONG PASSWORD");

}

}

public static void book\_management()

{

int option;

int pass\_status = get\_pass();

if(pass\_status == 1)

{

while(true)

{

System.out.println();

System.out.println("---> INFO <---");

System.out.println("Total Books : "+total\_books);

System.out.println();

System.out.println("1) Add Book");

System.out.println("2) Delete Book");

System.out.println("3) Update Book");

System.out.println("4) Go to Home Page");

System.out.println();

System.out.print("Enter Desired Operation (INDEX) : ");

option = scanner.nextInt();

if(option == 1)

add\_book();

else if(option == 2)

delete\_book();

else if(option == 3)

update\_book();

else if(option == 4)

break;

}

System.out.println("EXITING");

}

else

{

System.out.println("WRONG PASSWORD");

}

}

public static void Library()

{

int option;

int rollNo;

int found = 0;

int exit = 0;

System.out.println();

System.out.print("Enter ROLL-NUMBER to search : ");

rollNo = scanner.nextInt();

for(Student student : students)

{

if(student.get\_rollnum() == rollNo)

{

found = 1;

while(true)

{

System.out.println();

System.out.println("---> INFO <---");

System.out.println("Total Books Available : "+total\_books);

System.out.println();

System.out.println("1) Issue Book");

System.out.println("2) Return Book");

System.out.println("3) Calculate Fine");

System.out.println("4) Go to Home Page");

System.out.println();

System.out.print("Enter Desired Operation (INDEX) : ");

option = scanner.nextInt();

if(option == 1)

student.issue\_book();

else if(option == 2)

student.return\_book();

else if(option == 3)

student.calculate\_fine();

else if(option == 4)

{

exit = 1;

break;

}

}

}

}

if(found == 0 && exit == 0)

{

System.out.println("Roll Number not found, TRY AGAIN");

}

}

public static int get\_pass()

{

Scanner scanner = new Scanner(System.in);

System.out.print("Enter Password : ");

String temp\_pass = scanner.nextLine();

if(temp\_pass.equals(password))

{

return 1;

}

else

{

return 0;

}

}

}

**Student.java :**

import java.util.ArrayList;

import java.util.Scanner;

public class Student

{

// Information Register for Each Student

private String name;

private int age;

private int roll\_num;

private ArrayList<String> books\_issued = new ArrayList<>();

private int num\_books\_issued = 0;

private int fine = 0;

// Functioning Methods

public Student()

{

Scanner scanner = new Scanner(System.in);

System.out.print("Enter Student Name : ");

this.name = scanner.nextLine();

System.out.print("Enter Student Age : ");

this.age = scanner.nextInt();

System.out.print("Enter Student roll number : ");

this.roll\_num = scanner.nextInt();

}

public void Update()

{

Scanner scanner = new Scanner(System.in);

System.out.print("Enter Student Name : ");

this.name = scanner.nextLine();

System.out.print("Enter Student Age : ");

this.age = scanner.nextInt();

System.out.print("Enter Student roll number : ");

this.roll\_num = scanner.nextInt();

}

public int get\_rollnum()

{

return roll\_num;

}

public void issue\_book()

{

String option;

int found = 0;

Scanner scanner = new Scanner(System.in);

System.out.println("Available Books : ");

for(String book: Book.available\_books)

{

System.out.println(book);

}

System.out.println();

System.out.print("Enter Book Name : ");

option = scanner.nextLine();

for(String book: Book.available\_books)

{

if((book).equals(option))

found += 1;

}

if(found == 1)

{

System.out.println("BOOK ISSUED SUCCESSFULLY");

books\_issued.add(option);

Book.available\_books.remove(option);

num\_books\_issued += 1;

Management\_Sys.total\_books -= 1;

}

else if(found == 0)

{

System.out.println("BOOK NOT AVAILABLE IN LIBRARY OR IS ISSUED");

}

}

public void return\_book()

{

String name;

int found = 0;

System.out.println("ISSUED BOOKS : ");

for(String book: (books\_issued))

{

System.out.println(book);

}

System.out.println();

Scanner scanner = new Scanner(System.in);

System.out.print("Enter Name of Book to Return : ");

name = scanner.nextLine();

for(String book: (books\_issued))

{

if(book.equals(name))

{

found += 1;

}

}

if(found == 1)

{

System.out.println("BOOK SUCCESSFULLY RETURNED");

Book.available\_books.add(name);

books\_issued.remove(name);

num\_books\_issued -= 1;

Management\_Sys.total\_books += 1;

}

else

{

System.out.println("YOU HAVE NOT ISSUED THE BOOK");

}

}

public void calculate\_fine()

{

int time\_entered;

Scanner scanner = new Scanner(System.in);

for(String book : books\_issued)

{

int time\_limit = Book.books\_store.get(book);

System.out.print("For How Many days have you had the book \"" + book + "\" : ");

time\_entered = scanner.nextInt();

if((time\_entered-time\_limit)> 0 && (time\_entered-time\_limit)<= 3)

{

fine += 100;

}

else if((time\_entered-time\_limit)> 3 && (time\_entered-time\_limit)<= 7)

{

fine += 200;

}

else if((time\_entered-time\_limit)> 7)

{

fine += 500;

}

time\_entered = 0;

time\_limit = 0;

}

System.out.println("Number of Books Issued : "+num\_books\_issued);

System.out.println("Fine : "+fine);

}

}

**Book.java :**

import java.util.ArrayList;

import java.util.HashMap;

public class Book

{

public static HashMap<String, Integer> books\_store = new HashMap<>();

public static ArrayList<String> available\_books = new ArrayList<>();

public static void store\_book()

{

books\_store.put("Harry Potter and the Sorcerer's stone", 7);

books\_store.put("Harry Potter and the Chamber of Secrets", 7);

books\_store.put("Harry Potter and the Prisoner of Azkaban", 7);

books\_store.put("Harry Potter and the Goblet of Fire", 7);

books\_store.put("Harry Potter and the Order of the Pheonix", 7);

available\_books.add("Harry Potter and the Sorcerer's stone");

available\_books.add("Harry Potter and the Chamber of Secrets");

available\_books.add("Harry Potter and the Prisoner of Azkaban");

available\_books.add("Harry Potter and the Goblet of Fire");

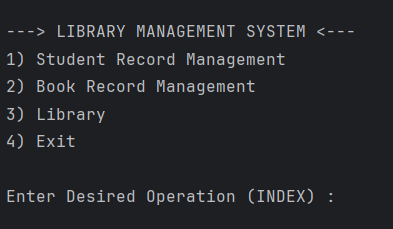
available\_books.add("Harry Potter and the Order of the Pheonix");

}

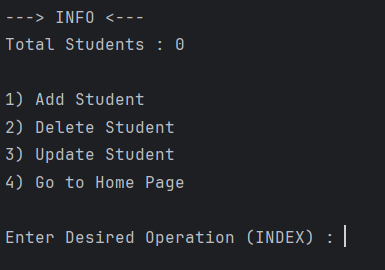
}

**OUTPUTS :**

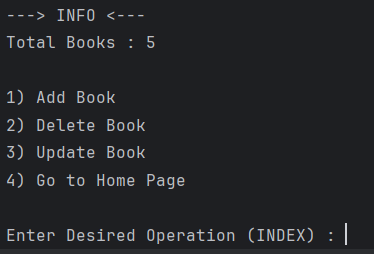
Home Page :



Student Management :



Book Mangement Page :



Library Page :

