

Jomo Kenyatta University of Agriculture and Technology

**ICS 2175**

**UNIT PROJECT**

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**ENM221-0040/2020**

**MECHATRONIC ENGINEERING**

**Library Management System**

**Problem Recognition and Definition**

I created a program that enables users to check for books in the library from anywhere around the world before they can access them physically from the library. It also shows whether the books are borrowed or are still available in the library. It utilizes arrays to store the book details which can only be changed by an administrator who has to login in using a password in order to complete the updating process. The program outputs the Name of the book, the Author and also the Genre of the book.

**Program Design**

In this code I have used the concept of Classes and Objects to solve the problem. I have created a menu for the user which consists of 5 different features.

1. To view details of View details of a book i.e. Title/Name, Author, Genre and Status of the book (borrowed or Available in the library).
2. To exit the Library Portal.

I have also created a menu for the Administrator that opens up after a password (7461) is verified. It includes;

1. To Add Book to the library program array.
2. To Delete Book from the library program array.
3. To view book details
4. To exit the Library Portal

I have used arrays to store the book details and password and array modules to add functionalities like adding book details to an array.Also I have use the concept of Switch Cases to automate the task and make it more useful and user friendly. User need to just enter the numbers as per given and it will perform the task.

**Program Construction**

/\*

\* To change this license header, choose License Headers in Project Properties.

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\* and open the template in the editor.

\*/

package schoolproj;

import java.util.ArrayList;

import java.util.Arrays;

import java.util.Scanner;

/\*\*

\*

\* @author ENM221-0040/2020

\*/

public class Library\_Management\_System {

String[] bookname={"Fire and Blood","The Firm","Differential Geometry","Harry Potter and the Philosopher's Stone","The Art of the Deal"};

String[] author={"George R.R Martin","John Grisham", "Prof.J.K Gatoto","J.K Rowling","Donald J.Trump"};

String[] genre={"Fantasy","Thriller","Educational","Adventure","Autobiography"};

String[] status={"Available","Borrowed","Available","Available","Borrowed"};

//main method

public static void main(String arv[]){

String profile;

Scanner sc=new Scanner(System.in);

System.out.println("\t\t\t LIBRARY MANAGEMENT SYSTEM");

System.out.println("\t\t\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

System.out.println("Are you an Administrator(admin) or Student(stud):");

profile=sc.nextLine();

Library\_Management\_System obj = new Library\_Management\_System ();

if ("stud".equals(profile)){

obj.menu();

int i=0;

while(i<2){

System.out.print("\nPlease Enter choice :");

i=Integer.parseInt(sc.nextLine());

/\*\* Use Switch Case Statements to navigate through the buttons \*\*/

switch(i)

{

case 1:

{

obj.getInfo();

System.out.print("\nPress Enter to Continue...");

sc.nextLine();

System.out.print("\033[H\033[2J");

obj.menu();

break;

}

case 2:

{

obj.exit();

}

}

}

}else if("admin".equals(profile)){

String [] pass={"7461"};

String password;

System.out.print("Admin Enter password --------: ");

password=sc.nextLine();

//if(password==pass[0]){}

if (pass[0] == null ? password == null : pass[0].equals(password)){

System.out.println("Welcome Admin");

obj.admin();

}else{

System.out.println("Wrong Password");

}

}

}

public void exit(){

System.out.println("\n\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

System.out.println("Thank You For Using Waweru's Software :) ");

System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

System.exit(0);

}

public void getInfo(){

String search\_name;

Scanner sc=new Scanner(System.in);

System.out.print("Enter Book name --------: ");

search\_name=sc.nextLine();

int found=0;

//while(i<bookname.length)

for(int i=0;i<bookname.length;i++){

if(bookname[i].equals(search\_name)){

found=found+i;

}

}

//if(search\_name==bookname[i]){}

if(found>0){

System.out.println(bookname[found]);

System.out.println("Author -->"+author[found]);

System.out.println("Genre --->"+genre[found]);

System.out.println("Status --->"+status[found]);

}else{

System.out.println("-----Such Book does not exist !!!-----");

}

}

//The method verifys the admins password

public void passwordVerification(){

String [] pass={"7461"};

String password;

Scanner sc=new Scanner(System.in);

System.out.print("Admin Enter password --------: ");

password=sc.nextLine();

//if(password==pass[0]){}

if (pass[0] == null ? password == null : pass[0].equals(password)){

System.out.println("Welcome Admin");

}else{

System.out.println("Wrong Password");

}

}

public void menu(){

System.out.println("\t\t\t --------------------");

System.out.println("\t\t\t WELCOME STUDENT");

System.out.println("\t\t\t --------------------");

System.out.println("Press 1 : To See an Book Details ");

System.out.println("Press 2 : To Exit the Lib Portal");

}

// Admin can view or add a bookto the library array

public void admin() {

System.out.println("Press 1 : To Add Book ");

System.out.println("Press 2 : To Delete Book ");

System.out.println("Press 3 : To See an Book Details ");

System.out.println("Press 4 : To Exit the Admin Portal");

int i=0;

while(i<4){

Scanner sc=new Scanner(System.in);

System.out.print("\nPlease Enter choice :");

i=Integer.parseInt(sc.nextLine());

/\*\* Use Switch Case Statements to navigate through the buttons \*\*/

switch(i)

{

case 1: //update book details

{

try{

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

ArrayList<String>arrayList1=new ArrayList<>(Arrays.asList(bookname));

System.out.println("Enter Book Name ----> ");

arrayList1.add(sc.nextLine());

bookname = arrayList1.toArray(bookname);

ArrayList<String>arrayList2=new ArrayList<>(Arrays.asList(author));

System.out.println("Enter Author ----> ");

arrayList2.add(sc.nextLine());

author = arrayList2.toArray(author);

ArrayList<String>arrayList3=new ArrayList<>(Arrays.asList(genre));

System.out.println("Enter Genre ----> ");

arrayList3.add(sc.nextLine());

genre = arrayList3.toArray(genre);

ArrayList<String>arrayList4=new ArrayList<>(Arrays.asList(status));

System.out.println("Enter Status(Available OR Borrowed) ----> ");

arrayList4.add(sc.nextLine());

status = arrayList4.toArray(status);

System.out.println("UPDATE COMPLETE !!! ");

System.out.println("---------OUTPUT----------");

System.out.println("Array after adding element: "+Arrays.toString(bookname));

System.out.println("Array after adding element: "+Arrays.toString(author));

System.out.println("Array after adding element: "+Arrays.toString(genre));

System.out.println("Array after adding element: "+Arrays.toString(status));

}catch(Exception e){

System.out.println("Error Incurred ");

}

break;

}

case 2://delete book

{

try{

String bookName;

System.out.print("Enter Book name --------: ");

bookName=sc.nextLine();

int found=0;

//while(i<bookname.length)

for(int j=0;i<bookname.length;j++){

if(bookname[j].equals(bookName)){

for(int k = j; k < bookname.length - 1; k++){

bookname[k] = bookname[k+1];

author[k] = author[k+1];

genre[k] = genre[k+1];

status[k] = status[k+1];

}

break;

}else{

System.out.println("-----Such Book does not exist !!!-----");

}

}

System.out.println("DELETION COMPLETE !!! ");

System.out.println("---------OUTPUT----------");

System.out.println("Array after deleting element: "+Arrays.toString(bookname));

System.out.println("Array after deleting element: "+Arrays.toString(author));

System.out.println("Array after deleting element: "+Arrays.toString(genre));

System.out.println("Array after deleting element: "+Arrays.toString(status));

}catch(Exception e){

System.out.println("Error Incurred ");

}

break;

}

case 3://See book details

{

try{

String bookName;

System.out.print("Enter Book name --------: ");

bookName=sc.nextLine();

int found=0;

//while(i<bookname.length)

for(int j=0;i<bookname.length;j++){

if(bookname[j].equals(bookName)){

found=found+j;

}

}

//if(search\_name==bookname[i]){}

if(found>0){

System.out.println(bookname[found]);

System.out.println("Author -->"+author[found]);

System.out.println("Genre --->"+genre[found]);

System.out.println("Status --->"+status[found]);

}else{

System.out.println("-----Such Book does not exist !!!-----");

}

}catch(Exception e){

System.out.println("Error ");

}

}

case 4://exit Admin portal

{

exit();

}

}

}

}

}