

Gareth Evans: Assignment for Lab 14

Lab 14: Program Code

```
/**
 *
 * Lab 14, Book Class
 *
 * Written by Gareth Evans
 *
 * 22/04/99
 *
 */
public class Book
{
    private String BookName;
    private String Author;
    private int ID;
    private int YearPublished;
    private int Status;
    private String Borrower;
    private int DueDate;

    public void setBookName(String tempname)
    { BookName = tempname; }

    public String getBookName()
    { return BookName; }

    public void setAuthor(String tempauthor)
    { Author = tempauthor; }

    public String getAuthor()
    { return Author; }

    public void setID(int tempID)
    { ID = tempID; }

    public int getID()
    { return ID; }

    public void setYearPublished(int tempYear)
    { YearPublished = tempYear; }

    public int getYearPublished()
    { return YearPublished; }

    public void setStatus(int tempStatus)
    { Status = tempStatus; }

    public int getStatus()
    { return Status; }

    public void setBorrower(String tempuser)
    { Borrower = tempuser; }

    public String getBorrower()
    { return Borrower; }

    public void setDueDate(int tempDueDate)
    { DueDate = tempDueDate; }

    public int getDueDate()
    { return DueDate; }
}
```

```

/**
 *
 * Lab 14: THE LIBRARY
 *
 * Written by Gareth Evans
 *
 * 22/04/99 to 04/05/99
 *
 * STATUS CONVENTION: 0 = Available; 1 = On-Loan; -1 = Record Empty
 *
 */

import java.bangor.*;

public class Lab14
{
    // Define Global Variables

    static Book[] BookList;
    static int NextBookID; // this variable gives the location of next available space
    static int TotalBooks; // this variable keeps track of the total number of books in
                           // the library

    // Define Methods for use in the Main Method...

    public static void DisplayStatus(int statusinfo) // this method outputs in text the
                                                    // availability
                                                    // of a book (see convention at top
                                                    // of code)
    {
        switch(BookList[statusinfo].getStatus())
        {
            case 0: System.out.println("Available");
                    break;

            case 1: System.out.println("On Loan");
                    break;

        }
    }

    public static void ShowReturnDate(int ReturnInfo) // outputs
    {
        switch(BookList[ReturnInfo].getDueDate())
        {
            case 0: System.out.println("Return date: Not on Loan");
                    break; // i.e. book not on loan

            default: System.out.println("Return date: Week " +
                                         BookList[ReturnInfo].getDueDate());
        }
    }

    public static void DisplayInfo1(int countinfo) // outputs book information
    {
        System.out.print("ID: ");
        System.out.print(BookList[countinfo].getID() + " ");
        System.out.print(BookList[countinfo].getBookName() + " ");
        System.out.print(BookList[countinfo].getAuthor().toUpperCase() + " ");
        System.out.print("Status: ");
        DisplayStatus(countinfo); // uses above method
    }
}

```

```

public static void DisplayInfo2(int countinfo) // outputs complete book information
{
    System.out.println();
    System.out.println("Book ID:      " + countinfo);

    if ( (BookList[countinfo].getStatus()) > -1 ) // search only valid records
    {
        System.out.println("Title:      " + BookList[countinfo].getBookName());
        System.out.println("Author:     " + BookList[countinfo].getAuthor());
        System.out.println("Year:      " + BookList[countinfo].getYearPublished());
        System.out.print("Status:      ");
        DisplayStatus(countinfo);
        System.out.println("Loan to:    " + BookList[countinfo].getBorrower());
        ShowReturnDate(countinfo); // uses above method
    }
    else System.out.println("There is no book in the library with this ID");
}

public static void DisplayInfo3(int input) // shows book ID, title, author and return
// date.
{
    System.out.print("Book ID: " + input);
    System.out.print(" Title:  " + BookList[input].getBookName());
    System.out.print(" Author:  " + BookList[input].getAuthor() + " ");
    ShowReturnDate(input); // uses above method
}

public static void NewBook(int ID) throws Exception
{
    String input; // variable for entering Author and Title
    int input2;  // variable for entering Year of Publication

    System.out.println();
    if (ID < 100) // check to see if there is any more room
    {
        BookList[ID].setID(ID); // Assign a Book ID
        BookList[ID].setStatus(0); // Set Status to "Available"

        System.out.println("Please enter the Details of the new Book Entry...");
        System.out.println();

        System.out.println("What is the Title of the Book? ");
        input = BasicIo.readString();
        BookList[NextBookID].setBookName(input); // Set the Name of the Book
        System.out.println();

        System.out.println("Who is the Author of the book? ");
        input = BasicIo.readString();
        BookList[NextBookID].setAuthor(input); // Set the Author of the book
        System.out.println();

        System.out.println("What was the Year of publication? ");
        input2 = BasicIo.readInteger();
        BookList[NextBookID].setYearPublished(input2); // Set Year of Publication
        System.out.println();
    }
}

public static void ListBooks()
{
    System.out.println();
    int listcount;

    for ( listcount = 0; listcount < 100; listcount++ ) // go through the array
    {
        if ( (BookList[listcount].getStatus()) > -1 ) // only display entered Books
        {
            DisplayInfo1(listcount); // calls the method above
        }
    }
    System.out.println();
    System.out.println("Total Number of Books in Library: " + TotalBooks);
}

```

```

public static void DeleteBook() throws Exception
{
    System.out.println();
    int delete;
    System.out.println("Enter the ID of the book you want to delete");
    delete = BasicIo.readInteger();
    System.out.println();

    switch(BookList[delete].getStatus())
    {
        case -1: System.out.println("There is no Book corresponding to that ID.");
                break; // i.e. this location is flagged as empty

        case 1: System.out.println("Note that " + BookList[delete].getBorrower()
                + " currently has the following book");
                // Notifies user that the book being deleted is on loan
                // Note: NO BREAK: we also want to execute the following code...

    default: System.out.print(BookList[delete].getBookName() + " ");
            System.out.println(BookList[delete].getAuthor());
            System.out.println("The above book has been removed from the library");

            BookList[delete].setStatus(-1); // set the status to "unused"
            TotalBooks = TotalBooks - 1; // decrease total number of books by 1
    }
}

public static void SearchTitle() throws Exception
{
    int Matches = 0;
    String searchT;
    int SearchCount;

    System.out.println();
    System.out.println("Enter a title of a book to search for");
    searchT = BasicIo.readString();
    System.out.println();

    for ( SearchCount = 0; SearchCount < 100; SearchCount++ ) // go through array
    {
        if ( (BookList[SearchCount].getStatus()) > -1 ) // search only valid records
        {
            if ( searchT.equals(BookList[SearchCount].getBookName()) )
                // checks to see whether the search string equals the book name
            {
                Matches++; // increment the number of matches found
                DisplayInfo1(SearchCount); // shows information about the book
            }
        }
    }
    System.out.println();
    System.out.println("Search results: " + Matches + " Match(es) found");
}

public static void SearchID() throws Exception
{
    int searchID;

    System.out.println();
    System.out.println("Enter an ID for more information");
    searchID = BasicIo.readInteger();

    DisplayInfo2(searchID); // see above method
}

public static void BookInfo() throws Exception
{
    int searchID; // variable to enter a Library book ID
    String name; // variable to enter the borrower's name
    int ReturnDate; // variable to enter the return date

    System.out.println();
    System.out.println("Enter an ID for a book");
    searchID = BasicIo.readInteger();

    DisplayInfo2(searchID); // shows information about that book (if it exists)
    System.out.println();
}

```

```

switch(BookList[searchID].getStatus())
{
    case(0): System.out.println();
             System.out.println("Enter the name of the person borrowing the book");
             name = BasicIo.readString();

             BookList[searchID].setBorrower(name); // set the borrower's name
             BookList[searchID].setStatus(1);      // set status to "on loan"

             System.out.println();
             System.out.println("Enter the return date");
             ReturnDate = BasicIo.readInteger(); // sets the return date

             BookList[searchID].setDueDate(ReturnDate);

             System.out.println();
             DisplayInfo2(searchID); // displays updated information

             break;

    case(1): System.out.println("This book is already on loan. ");
             break;
}
}

public static void PersonInfo() throws Exception
{
    String UserName;

    System.out.println();
    System.out.println("Enter a Name to search for to see any books that person has
                       borrowed");
    UserName = BasicIo.readString();
    System.out.println();

    for (int i=0; i<100; i++) // search the book list for any matching borrowers
    {
        if (BookList[i].getBorrower().equals(UserName))
        {
            DisplayInfo3(i); // uses above method
        }
    }
    System.out.println();
}

public static void BookReturn() throws Exception
{
    int Return;

    System.out.println();
    System.out.println("Enter the ID of the book that has been returned");
    Return = BasicIo.readInteger();
    System.out.println();

    switch(BookList[Return].getStatus())
    {
        case(-1): System.out.println("There is no book with that ID");
                 break;

        case(0): System.out.println("That book is not on loan");
                 break;

        case(1): System.out.print("Returning book.... ");
                 BookList[Return].setStatus(0); // set the status to "Available"
                 BookList[Return].setDueDate(0); // set the due date to 0, default
                 BookList[Return].setBorrower("-"); // set the borrower to default
                 System.out.println("Done");
                 break;
    }
}
}

```

```

public static void Overdue() throws Exception
{
    int Date;

    System.out.println();
    System.out.println("Enter a date to search for overdue books");
    Date = BasicIo.readInteger();
    System.out.println();
    System.out.println("Overdue books....");
    System.out.println();

    for (int i=0; i<100; i++)
    {
        if (BookList[i].getStatus() == 1) // if the status is set to "On loan"
        {
            if (BookList[i].getDueDate() < Date) // if the book IS overdue
            {
                DisplayInfo3(i); // uses above method
            }
        }
    }
    System.out.println();
}

/**
 *
 * main
 *
 */

public static void main(String arg[]) throws Exception
{
    // Define the Variables

    int Choice; // variable for use in the menu structure

    // INITIALISE VARIABLES

    NextBookID = 0; // set the next free space to the first element of the array
    TotalBooks = 0; // indicates that no books exist in the system at the start

    // Define the Book List

    BookList = new Book[100];
    for (int templ = 0; templ < 100; templ++)
    {
        BookList[templ] = new Book();
        BookList[templ].setStatus(-1); // set the Status to "Record Empty"
        BookList[templ].setDueDate(0); // i.e. book is not on loan to begin with
        BookList[templ].setBorrower("-"); // i.e. book is not on loan to begin with
    }

    // MENU PART OF PROGRAM

    do // repeat this code until the user wants to exit
    {
        System.out.println();
        System.out.println("MAIN MENU - PLEASE ENTER YOUR CHOICE");
        System.out.println("-----");
        System.out.println();
        System.out.println("1. Enter New Book");
        System.out.println("2. List All Books");
        System.out.println("3: Delete Book");
        System.out.println("4. Search Book by Title");
        System.out.println("5: Search Book by ID");
        System.out.println("6: Book Loan");
        System.out.println("7: Person Information");
        System.out.println("8: Book Return");
        System.out.println("9: Books Overdue");
        System.out.println();
        System.out.println("0: EXIT");
        System.out.println();
        Choice = BasicIo.readInteger();
    }
}

```

```

switch(Choice)
{
    case 1:  NewBook(NextBookID); // Enter a New Book
            NextBookID++; // Increment the index for the next book
            TotalBooks++; // Increment total # of books in the library
            break;

    case 2:  ListBooks(); // List All Books
            break;

    case 3:  DeleteBook(); // Delete Book
            break;

    case 4:  SearchTitle(); // Search Book by Title
            break;

    case 5:  SearchID(); // Search Book by ID
            break;

    case 6:  BookInfo(); // Get Information on Books
            break;

    case 7:  PersonInfo(); // Displays Person Information
            break;

    case 8:  BookReturn(); // Return a Book
            break;

    case 9:  Overdue(); // Show Overdue Books
            break;

    case 0:  System.out.println("The Program will now close...");
            break;

    default: System.out.println("Sorry, Wrong Number. Please Try Again. ");
}
}
while (Choice>0);

// end of code
}
}

```

Lab 14: Sample Output

```
M:\cafe\Projects Semester 2\Lab14 Assignment>java Lab14
Symantec Java! JustInTime Compiler Version 210.050 for JDK 1.1
Copyright (C) 1996-97 Symantec Corporation
```

```
MAIN MENU - PLEASE ENTER YOUR CHOICE
```

```
-----
```

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?

C'mon Midffild

Who is the Author of the book?

Mei Thomas

What was the Year of publication?

1995

```
MAIN MENU - PLEASE ENTER YOUR CHOICE
```

```
-----
```

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?

Joke Book

Who is the Author of the book?

Mr. Funny

What was the Year of publication?

1999

```
MAIN MENU - PLEASE ENTER YOUR CHOICE
```

```
-----
```

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?
SEECs E1027 Guide

Who is the Author of the book?
Frank Margrave

What was the Year of publication?
1998

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?
Greak Expectations

Who is the Author of the book?
Charles Dickens

What was the Year of publication?
1850

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?
Home Town

Who is the Author of the book?
Tracy Kielder

What was the Year of publication?
1998

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?
Star Wars

Who is the Author of the book?
Terry Brooks

What was the Year of publication?
1999

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?
We'll Meet Again

Who is the Author of the book?
Mary Higgins Clark

What was the Year of publication?
1999

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

1

Please enter the Details of the new Book Entry...

What is the Title of the Book?
Premiership Guide 98/99

Who is the Author of the book?
Ianto Roberts

What was the Year of publication?
1998

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

2

ID: 0	C'mon Midffild	MEI THOMAS	Status: Available
ID: 1	Joke Book	MR. FUNNY	Status: Available
ID: 2	SEECs E1027 Guide	FRANK MARGRAVE	Status: Available
ID: 3	Greak Expectations	CHARLES DICKENS	Status: Available
ID: 4	Home Town	TRACY KIELDER	Status: Available
ID: 5	Star Wars	TERRY BROOKS	Status: Available
ID: 6	We'll Meet Again	MARY HIGGINS CLARK	Status: Available
ID: 7	Premiership Guide 98/99	IANTO ROBERTS	Status: Available

Total Number of Books in Library: 8

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

6

Enter an ID for a book
2

Book ID:	2
Title:	SEECs E1027 Guide
Author:	Frank Margrave
Year:	1998
Status:	Available
Loan to:	-
Return date:	Not on Loan

Enter the name of the person borrowing the book
Gareth Evans

Enter the return date
10

Book ID: 2
Title: SEECS E1027 Guide
Author: Frank Margrave
Year: 1998
Status: On Loan
Loan to: Gareth Evans
Return date: Week 10

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

6

Enter an ID for a book

6

Book ID: 6
Title: We'll Meet Again
Author: Mary Higgins Clark
Year: 1999
Status: Available
Loan to: -
Return date: Not on Loan

Enter the name of the person borrowing the book
Ioan Bennett

Enter the return date

13

Book ID: 6
Title: We'll Meet Again
Author: Mary Higgins Clark
Year: 1999
Status: On Loan
Loan to: Ioan Bennett
Return date: Week 13

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

2

ID: 0 C'mon Midffild MEI THOMAS Status: Available
ID: 1 Joke Book MR. FUNNY Status: Available
ID: 2 SEECS E1027 Guide FRANK MARGRAVE Status: On Loan
ID: 3 Greak Expectations CHARLES DICKENS Status: Available
ID: 4 Home Town TRACY KIELDER Status: Available
ID: 5 Star Wars TERRY BROOKS Status: Available
ID: 6 We'll Meet Again MARY HIGGINS CLARK Status: On Loan
ID: 7 Premiership Guide 98/99 IANTO ROBERTS Status: Available

Total Number of Books in Library: 8

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

6

Enter an ID for a book

2

Book ID: 2
Title: SEECS E1027 Guide
Author: Frank Margrave
Year: 1998
Status: On Loan
Loan to: Gareth Evans
Return date: Week 10

This book is already on loan.

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

5

Enter an ID for more information

4

Book ID: 4
Title: Home Town
Author: Tracy Kielder
Year: 1998
Status: Available
Loan to: -
Return date: Not on Loan

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

7

Enter a Name to search for to see any books that person has borrowed
Ioan Bennett

Book ID: 6 Title: We'll Meet Again Author: Mary Higgins Clark Return date: Week
13

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

9

Enter a date to search for overdue books
20

Overdue books....

Book ID: 2 Title: SECS E1027 Guide Author: Frank Margrave Return date: Week 10
Book ID: 6 Title: We'll Meet Again Author: Mary Higgins Clark Return date: Week 13

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

3

Enter the ID of the book you want to delete
5

Star Wars Terry Brooks
The above book has been removed from the library

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
- 3: Delete Book
4. Search Book by Title
- 5: Search Book by ID
- 6: Book Loan
- 7: Person Information
- 8: Book Return
- 9: Books Overdue

0: EXIT

2

ID: 0 C'mon Midffild MEI THOMAS Status: Available
ID: 1 Joke Book MR. FUNNY Status: Available
ID: 2 SEecs E1027 Guide FRANK MARGRAVE Status: On Loan
ID: 3 Greak Expectations CHARLES DICKENS Status: Available
ID: 4 Home Town TRACY KIELDER Status: Available
ID: 6 We'll Meet Again MARY HIGGINS CLARK Status: On Loan
ID: 7 Premiership Guide 98/99 IANTO ROBERTS Status: Available

Total Number of Books in Library: 7

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
3: Delete Book
4. Search Book by Title
5: Search Book by ID
6: Book Loan
7: Person Information
8: Book Return
9: Books Overdue

0: EXIT

8

Enter the ID of the book that has been returned

6

Returning book..... Done

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
3: Delete Book
4. Search Book by Title
5: Search Book by ID
6: Book Loan
7: Person Information
8: Book Return
9: Books Overdue

0: EXIT

2

ID: 0 C'mon Midffild MEI THOMAS Status: Available
ID: 1 Joke Book MR. FUNNY Status: Available
ID: 2 SEecs E1027 Guide FRANK MARGRAVE Status: On Loan
ID: 3 Greak Expectations CHARLES DICKENS Status: Available
ID: 4 Home Town TRACY KIELDER Status: Available
ID: 6 We'll Meet Again MARY HIGGINS CLARK Status: Available
ID: 7 Premiership Guide 98/99 IANTO ROBERTS Status: Available

Total Number of Books in Library: 7

MAIN MENU - PLEASE ENTER YOUR CHOICE

1. Enter New Book
2. List All Books
3: Delete Book
4. Search Book by Title
5: Search Book by ID
6: Book Loan
7: Person Information
8: Book Return
9: Books Overdue

0: EXIT

4

Enter a title of a book to search for
C'mon Midffild

ID: 0 C'mon Midffild MEI THOMAS Status: Available

Search results: 1 Match(es) found

MAIN MENU - PLEASE ENTER YOUR CHOICE

-
1. Enter New Book
 2. List All Books
 - 3: Delete Book
 4. Search Book by Title
 - 5: Search Book by ID
 - 6: Book Loan
 - 7: Person Information
 - 8: Book Return
 - 9: Books Overdue

0: EXIT

0

The Program will now close...