```java
package book;

import java.text.DateFormat;
import java.text.ParseException;
import java.util.Date;
import java.text.SimpleDateFormat;
import java.util.Scanner;

/**
 *
 * @author QAB00796884
 * David Fodor
 */
public class Main {

    public static Scanner input = new Scanner(System.in);
    static Book[] bookArray;
    public static int bookArrayInd = 0;

    public static void main(String[] args) {

        System.out.println("Welcome to this program");
        System.out.println("---");
        System.out.println("How many books should my application store?");

        //We have to make sure the user enters a number here, not something else
        //which would cause an input mismatch exception

        while(!input.hasNextInt()){
            input.nextLine();
            System.out.println("---");
            System.out.println("That's not a number mate");
        }

        //We declare an array with the size of the user input
        int number = input.nextInt();
        bookArray = new Book[number];

        int choice;

        do{
            System.out.println("---");
            System.out.println("1. Add book (Type in title)");
            System.out.println("2. Add book details (Type in title)");
            System.out.println("3. Display book (Type in title)");
            System.out.println("4. List all books");
            System.out.println("5. Exit");

            choice = input.nextInt();

            switch (choice) {
                case 1:
                    //Add a new book (Only asks for a title, the rest of the
                    //details of the book can be added later.)
                    if (bookArrayInd < bookArray.length)
                        AddBook();
                    else{
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                    System.out.println("---");
                    System.out.println("You cannot add any more books");
                }
                break;
            case 2:
                //This is where you add the rest of the details
                AddDetails();
                break;
            case 3:
                //Here you can get all the details of a specific book,
                //chosen by typing in the book's name, non-case-sensitive
                DisplayBook();
                break;
            case 4:
                //This choice displays the title of all the books
                System.out.println("---");
                for (int i = 0; i < bookArrayInd; i++) {
                    System.out.println(bookArray[i].getTitle() );

                }

                break;
            case 5:
                //Number five is the exit option and it fulfils the while loop criteria,
                //thus ending the program
                break;
            default:
                //If it's not 1-5 you can try again buddy
                System.out.println("---");
                System.out.println("Invalid choice");
        }

    }while(choice != 5);

    System.out.println("---");
    System.out.println("Goodbye!");
}

public static void AddBook(){
    System.out.println("---");
    System.out.println("Type in the title of the book you would like to add");
    String title = input.next();
    bookArray[bookArrayInd] = new Book(title) {};
    //bookArrayInd keeps track of the current index of the book array,
    //aka how many books have been added so far

    //It is a little more elegant to set these default values to the properties
    //than just to simply let them display 'null'
    bookArray[bookArrayInd].changeAuthor("No author specified");
    bookArray[bookArrayInd].changeISBN("No ISBN specified");
    bookArray[bookArrayInd].changePublisher("No publisher specified");
    bookArray[bookArrayInd].changePages("No number of pages specified");
    bookArray[bookArrayInd].changeLanguage("No language specified");

    bookArrayInd++;
    System.out.println("---");
    System.out.println("Book added.");
```

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}

public static void AddDetails(){

    System.out.println("---");
    System.out.println("Type in the title of the book you would like to add details to");
    String title = input.next();

    //Obviously you can't add details to a book which doesn't even exist.
    //Default is false, we'll see if the program can find it.
    boolean bookFound = false;

    for (int i = 0; i < bookArrayInd; i++) {
        if (bookArray[i].getTitle().equalsIgnoreCase(title)){

            //Seems like the program has found a book with this title
            //We are in a submenu now
            System.out.println("---");
            System.out.println("1. Add title");
            System.out.println("2. Add author");
            System.out.println("3. Add ISBN");
            System.out.println("4. Add publisher");
            System.out.println("5. Add number of pages");
            System.out.println("6. Add language");
            System.out.println("7. Add publication date");
            System.out.println("8. Back");

            int choice;

            do{

                choice = input.nextInt();

                switch (choice) {
                    //The following lines should be self-explanatory.
                    case 1:
                        System.out.println("---");
                        System.out.println("Type in the new title");
                        bookArray[i].changeTitle(input.next() );
                        System.out.println("Title added");
                        break;
                    case 2:
                        System.out.println("---");
                        System.out.println("Type in the new author");
                        bookArray[i].changeAuthor(input.next() );
                        System.out.println("Author added");
                        break;
                    case 3:
                        System.out.println("---");
                        System.out.println("Type in the new ISBN");
                        bookArray[i].changeISBN(input.next() );
                        System.out.println("ISBN added");
                        break;
                    case 4:
                        System.out.println("---");
                        System.out.println("Type in the new publisher");
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                bookArray[i].changePublisher(input.next() );
                System.out.println("Publisher added");
                break;
            case 5:
                System.out.println("---");
                System.out.println("Type in the new number of pages");
                bookArray[i].changePages(input.next() );
                System.out.println("Number of pages added");
                break;
            case 6:
                System.out.println("---");
                System.out.println("Type in the new language");
                bookArray[i].changeLanguage(input.next() );
                System.out.println("Language added");
                break;
            case 7:
                //The date is a bit different.
                //You have to type in the date in the suggested format,
                //otherwise, the program won't accept it.

                System.out.println("---");
                System.out.println("Type in the new date");
                System.out.println("DD/MM/YYYY");

                String dateStr = input.next();
                DateFormat dateFormat = new SimpleDateFormat("dd/MM/yyyy");

                Date date;

                try {

                    dateFormat.setLenient(false);
                    date = dateFormat.parse(dateStr);

                    bookArray[i].changePublicationDate(date);

                    //The date is accepted, changed, back to the previous menu
                    System.out.println("---");
                    System.out.println("Date added");
                    System.out.println("---");
                    System.out.println("1. Add title");
                    System.out.println("2. Add author");
                    System.out.println("3. Add ISBN");
                    System.out.println("4. Add publisher");
                    System.out.println("5. Add number of pages");
                    System.out.println("6. Add language");
                    System.out.println("7. Add publication date");
                    System.out.println("8. Back");

                }
                catch (ParseException e) {
                    //The program failed to recognise the user input string as a
                    date
                    System.out.println("---");
                    System.out.println("That's not a date mate");
                    System.out.println("---");
                    System.out.println("1. Add title");
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                                System.out.println("2. Add author");
                                System.out.println("3. Add ISBN");
                                System.out.println("4. Add publisher");
                                System.out.println("5. Add number of pages");
                                System.out.println("6. Add language");
                                System.out.println("7. Add publication date");
                                System.out.println("8. Back");
                            }
                            break;
                        case 8:
                            break;
                        default:
                            //The user didn't choose 1-8
                            System.out.println("---");
                            System.out.println("Invalid choice");
                    }

                }while(choice != 8);

                bookFound = true;

                break;
                }

        }

        if (!bookFound){
            System.out.println("---");
            System.out.println("No such book.");
        }

    }

    public static void DisplayBook(){
        System.out.println("---");
        System.out.println("Type in the title of the book you would like to display the
        details of");
        String title = input.next();

        boolean bookFound = false;

        for (int i = 0; i < bookArrayInd; i++) {
            if (bookArray[i].getTitle().equalsIgnoreCase(title)){

                System.out.println("---");
                System.out.println(bookArray[i].toString() );

                bookFound = true;

                break;
                }

        }

        if (!bookFound){
            System.out.println("---");
            System.out.println("No such book.");
```

```
        }

    }

}

package book;
import java.util.Date;

/**
 *
 * @author QAB00796884
 * David Fodor
 */
abstract class Book {

    private String title;
    private String author;
    private String ISBN;
    private String publisher;
    private String pages;
    private String language;
    private Date publicationDate;

    public Book(String title) {
        this.title = title;
    }

    public Book(String title, String author, String ISBN, String publisher, String pages,
    String language, Date publicationDate) {
        this.title = title;
        this.author = author;
        this.ISBN = ISBN;
        this.publisher = publisher;
        this.pages = pages;
        this.language = language;
        this.publicationDate = publicationDate;
    }

    public String getTitle() {
        return title;
    }

    public void changeTitle(String newTitle){
        title = newTitle;
    }

    public String getAuthor() {
        return author;
    }

    public void changeAuthor(String newAuthor){
        author = newAuthor;
    }

    public String getISBN() {
        return ISBN;
```

```
    }

    public void changeISBN(String newISBN){
        ISBN = newISBN;
    }

    public String getPublisher() {
        return publisher;
    }

    public void changePublisher(String newPublisher){
        publisher = newPublisher;
    }

    public String getPages() {
        return pages;
    }

    public void changePages(String newPages){
        pages = newPages;
    }

    public String getLanguage() {
        return language;
    }

    public void changeLanguage(String newLanguage){
        language = newLanguage;
    }

    public Date getPublicationDate() {
        return publicationDate;
    }

    public void changePublicationDate(Date newPublicationDate){
        publicationDate = newPublicationDate;
    }

    @Override
    public String toString(){

        if (publicationDate != null)
            return "Title: "+title + "\nAuthor: "+author + "\nISBN: "+ISBN + "\nPublisher: "+
            publisher + "\nPages: "+pages + "\nLanguage: "+language + "\nPublication Date: "+
            publicationDate;
        else
            return "Title: "+title + "\nAuthor: "+author + "\nISBN: "+ISBN + "\nPublisher: "+
            publisher + "\nPages: "+pages + "\nLanguage: "+language + "\nPublication Date: "+
            "No publication date specified";
    }



}
```