

CS101 Quiz 5

Name:

You are given two classes, **Student** and **LocalDate**, for which you have the constructor and methods specified on the right hand side.

Your assignment is to write a class named **LibraryBook** as Specified below. You are expected to fill the code in the spaces provided on the next page.

Instance variables and signatures of the methods are given for your convenience. Also, a sample run with class and its methods is shown below with a main method in a **LibraryRunner** class.

```
public class Student {  
    // Constructor  
    public Student (String name, int ID)  
    // toString  
    public String toString()  
}  
  
public class LocalDate{  
    // Constructs a local date with the necessary arguments  
    public LocalDate(int year, int month, int dayOfMonth)  
    // Obtains today's date from the system clock  
    public static LocalDate now()  
    // Checks if this date is equal to another date.  
    public boolean equals(Object obj)  
    // Returns a String representation of this Date.  
    public String toString()  
    // Compares this date to another date.  
    int compareTo(LocalDate other)  
    // Returns a copy of this LocalDate with added days  
    public LocalDate plusDays(int daysToAdd)  
}  
  
// These classes are given to you!  
// Do NOT implement these classes.
```

```
public class LibraryRunner{  
    public static void main(String[] args){  
        LibraryBook b1 = new LibraryBook("Big Java: Late Objects", "Horstmann, Cay S.");  
        Student s1 = new Student("Ali", 1);  
        Student s2 = new Student("John", 2);  
        Student s3 = new Student("Doe", 3);  
        Student s4 = new Student("Veli", 4);  
        Student s5 = new Student("Ayse", 5);  
        Student s6 = new Student("Zerrin", 6);  
        b1.loan(s1);  
        b1.returnBook();  
        b1.loan(s2);  
        b1.loan(s3);  
        b1.returnBook();  
        b1.loan(s4);  
        System.out.println(b1);  
    }  
}
```

Sample Run

```
Book: Big Java: Late Objects  
Author: Horstmann, Cay S.  
Is on Loan: true  
Due date: 3.1.2022  
  
Loaned before by:  
1. Student: Name: Ali, ID: 1  
2. Student: Name: John, ID: 2  
3. Student: Name: Veli, ID: 4
```

```
public class LibraryBook{  
    private String title; // Title of the book.  
    private String author; // Author of the book.  
    private LocalDate dueDate; // No due date indicates the book is in the library.  
    private Student[] loaners; // Students who loaned the book.  
    private int timesLoaned; // Number of times book is loaned.  
    private final int MAX_NUMBER_OF_LOANERS = 100; // Limit on the maximum number of loaners.  
    private final int DURATION_OF_LOAN = 14; // Due date is in 14 days starting TODAY.
```

```

//Constructor
public LibraryBook(String title, String author){

    this.title = title;
    this.author = author;
    dueDate = null;
    timesLoaned = 0;
    loaners = new Student[MAX_NUMBER_OF_LOANERS];

}
//Loan Method – Loan the book to the student if it is available
// Return whether book loan was successful or not.
public boolean loan(Student s){

    if(timesLoaned<MAX_NUMBER_OF_LOANERS && !isOnLoan()){
        dueDate = LocalDate.now();
        dueDate = dueDate.plusDays(DURATION_OF_LOAN);
        loaners[timesLoaned++]=s;
        return true;
    }
    return false;
}

//Book Return Method – No due date indicates it is in the library.
public void returnBook(){

    dueDate = null;

}

//Check if the book is on loan or not.
public boolean isOnLoan(){

    return (dueDate!=null);

}

// A string representing the Book object with its title, author, whether on loan, due date, and the
// loaners with their specifics.
public String toString(){

    String result = "Book: "+this.title+"\n";
    result += "Author: "+this.author+"\n";
    result += "Is on Loan: "+this.isOnLoan()+"\n";
    result += "Due date: "+this.dueDate+"\n";
    result += "Loaned before by: \n";
    for(int i=0; i<timesLoaned; i++)
        result += (i+1) + ". Student: "+loaners[i)+"\n";
    return result;

}
}

```