

# Static Books

Suppose we have the following `Book` and `Library` classes.

```
class Book {
    public String title;
    public Library library;
    public static Book last = null;

    public Book(String name) {
        title = name;
        last = this;
        library = null;
    }

    public static String lastBookTitle() {
        return last.title;
    }

    public String getTitle() {
        return title;
    }
}

class Library {
    public Book[] books;
    public int index;
    public static int totalBooks = 0;

    public Library(int size) {
        books = new Book[size];
        index = 0;
    }

    public void addBook(Book book) {
        books[index] = book;
        index++;
        totalBooks++;
        book.library = this;
    }
}
```

- (a) For each modification below, determine whether the code of the `Library` and `Book` classes will compile or error if we **only** made that modification, i.e. treat each modification independently.
1. Change the `totalBooks` variable to **non static**
  2. Change the `lastBookTitle` method to **non static**
  3. Change the `addBook` method to **static**
  4. Change the `last` variable to **non static**
  5. Change the `library` variable to **static**

(b) Using the Book and Library classes from before, write the output of the main method below. If a line errors, put the precise reason it errors and continue execution.

```
1 public class Main {
2     public static void main(String[] args) {
3         System.out.println(Library.totalBooks);           -----
4         System.out.println(Book.lastBookTitle());        -----
5         System.out.println(Book.getTitle());             -----
6
7         Book goneGirl = new Book("Gone Girl");
8         Book fightClub = new Book("Fight Club");
9
10        System.out.println(goneGirl.title);              -----
11        System.out.println(Book.lastBookTitle());        -----
12        System.out.println(fightClub.lastBookTitle());   -----
13        System.out.println(goneGirl.last.title);         -----
14
15        Library libraryA = new Library(1);
16        Library libraryB = new Library(2);
17        libraryA.addBook(goneGirl);
18
19        System.out.println(libraryA.index);               -----
20        System.out.println(libraryA.totalBooks);         -----
21
22        libraryA.totalBooks = 0;
23        libraryB.addBook(fightClub);
24        libraryB.addBook(goneGirl);
25
26        System.out.println(libraryB.index);               -----
27        System.out.println(Library.totalBooks);          -----
28        System.out.println(goneGirl.library.books[0].title); -----
29    }
30 }
```