

Lab 10x

Inserting and deleting items from an one dimensional array are common and useful operations. In this lab, we will practice using **Insert** operation with array.

First, your program reads the titles of a collection of books from a data file and stores them in an array. You are required to define a user defined function to read data from a data file and store them in the array.

Once read, the program prints out the list of book titles, one title per line. You are required to define a user defined function to display the book titles.

Afterwards, the program goes into a loop prompting the user to add book titles, one at a time, to the collection. Each iteration through the loop:

- First, it prompts the user for a new book title. If this title is already in the collection, display an error message, Otherwise, it asks the user where to add the book in the collection. If the location entered is a valid location, insert the title, otherwise, display an error message.
- A user defined function is required to insert the value into the array the input to the function include: the new book title, and the location specified

This loop ends when the user enters an empty book title when prompted, i.e., press "ENTER" when prompted for book title.

Here is an example run of the program:

Books in the collection:

```
1 : The Untethered Soul: The Journey Beyond Yourself
2 : Ruby
3 : When I Found You
4 : The Pecan Man
5 : Yellow Crocus
6 : Take Me With You
7 : What She Left Behind
8 : The Alchemist
9 : We Are Water: A Novel (P.S.)
10 : The Nightingale
11 : Drowning Ruth: A Novel
12 : The Invention of Wings
13 : The Secret Life of Bees
14 : Cane River
15 : The Life We Bury
16 : The Plum Tree
17 : Shantaram: A Novel
18 : Middlesex: A Novel
19 : A Bend in the Road
```

20 : The Book of Awakening: Having the Life You Want by Being Present to the Life You Have

21 : Whistling Past the Graveyard

22 : A Spool of Blue Thread: A novel

23 : The Gifts of Imperfection: Let Go of Who You Think You're Supposed to Be and Embrace Who You Are

24 : What I Know For Sure

25 : A New Earth: Awakening to Your Life's Purpose

26 : While I Was Gone

27 : I Know This Much Is True: A Novel

28 : Night (Night)

29 : She's Come Undone

Please enter the title to add to the collection: Harry Potter

Please enter the location to add the new book: 2

After insertion ...

Books in the collection:

1 : The Untethered Soul: The Journey Beyond Yourself

2 : Harry Potter

3 : Ruby

4 : When I Found You

5 : The Pecan Man

6 : Yellow Crocus

7 : Take Me With You

8 : What She Left Behind

9 : The Alchemist

10 : We Are Water: A Novel (P.S.)

11 : The Nightingale

12 : Drowning Ruth: A Novel

13 : The Invention of Wings

14 : The Secret Life of Bees

15 : Cane River

16 : The Life We Bury

17 : The Plum Tree

18 : Shantaram: A Novel

19 : Middlesex: A Novel

20 : A Bend in the Road

21 : The Book of Awakening: Having the Life You Want by Being Present to the Life You Have

22 : Whistling Past the Graveyard

23 : A Spool of Blue Thread: A novel

24 : The Gifts of Imperfection: Let Go of Who You Think You're Supposed to Be and Embrace Who You Are

25 : What I Know For Sure

26 : A New Earth: Awakening to Your Life's Purpose

27 : While I Was Gone

28 : I Know This Much Is True: A Novel

29 : Night (Night)
 30 : She's Come Undone
 Please enter the title to add to the collection: The Plum Tree
 The book is already in the collection. Insertion not carried out.
 Please enter the title to add to the collection: How to Train Your Dragon
 Please enter the location to add the new book: 19
 After insertion ...
 Books in the collection:
 1 : The Untethered Soul: The Journey Beyond Yourself
 2 : Harry Potter
 3 : Ruby
 4 : When I Found You
 5 : The Pecan Man
 6 : Yellow Crocus
 7 : Take Me With You
 8 : What She Left Behind
 9 : The Alchemist
 10 : We Are Water: A Novel (P.S.)
 11 : The Nightingale
 12 : Drowning Ruth: A Novel
 13 : The Invention of Wings
 14 : The Secret Life of Bees
 15 : Cane River
 16 : The Life We Bury
 17 : The Plum Tree
 18 : Shantaram: A Novel
 19 : How to Train Your Dragon
 20 : Middlesex: A Novel
 21 : A Bend in the Road
 22 : The Book of Awakening: Having the Life You Want by Being Present to the Life You Have
 23 : Whistling Past the Graveyard
 24 : A Spool of Blue Thread: A novel
 25 : The Gifts of Imperfection: Let Go of Who You Think You're Supposed to Be and Embrace Who You Are
 26 : What I Know For Sure
 27 : A New Earth: Awakening to Your Life's Purpose
 28 : While I Was Gone
 29 : I Know This Much Is True: A Novel
 30 : Night (Night)
 31 : She's Come Undone
 Please enter the title to add to the collection:
 Problem you may encounter

When the program prompts the user to enter the location for inserting the new title, the user enters the location and also hits "RETURN". The "Return" key will be entered as the character

'\n' after the location number is read in the program. Afterwards, a getline statement is used to read the next book title to insert. At this point, the getline statement will read in '\n' as the next book title and prematurely terminate the loop.

To deal with this problem, you need to add the line:

```
cin.ignore(100, '\n');
```

to your program after the reading of the location, thereby skip over the '\n' character.