Some of the characteristics of a book are the title, author(s), publisher, ISBN, price, and year of publication.

Design the class **`Book`**. Each object of the class **`Book`** can hold the following information about a book:

- title,
- authors,
- publisher,
- ISBN,

Include the member functions to perform the various operations on the objects of Book. For example, the typical operations that can be performed on the title are to show the title, set the title. Add similar operations for the publisher, ISBN , and authors. Add the appropriate constructors and a destructor (if one is needed).

- Write the definitions of the member functions of the class **`Book`**
- Design a **`BookstoreManager`** class which creates a dynamic array of type **`Book`** (don't use `vectors`), and provide implementation for the following operations on books in the array with the given time-complexity
- A starter code and a sample output are provided.
- As shown in the sample output, books are kept sorted by ISBN. Each time a new book is inserted, it'll be inserted in the sorted order.
- You are not allowed to use any existing sorting and searching functions.

Functionalities available in BookstoreManager

Function	**Time-complexity**
`isEmpty()` *returns true if the array is empty, otherwise false*	`O(1)`
`isFull()` *returns true if the array is full, otherwise false*	`O(1)`
`listSize()` *prints the number of books in the array*	`O(1)`
`print()` *prints the content of the array*	`O(n)`

`insert(Book)` *asks user to enter new book info, and it adds the book to the array in sorted order* *if array is full, it'll double the size of the array*	`O(n)`
`remove(Book)` *asks user to enter ISBN info, and it removes the book from the array; shifts the other elements up in the array.* *Prints "Not Found" if search fails.*	`O(n)`
`removePublisher(string)` *asks user to enter publisher name, and it removes all the books with the same publisher from the array; shifts the other elements up in the array.* *Prints "Not Found" if search fails.*	`O(n)`
`search(Book)` *asks user to enter ISBN, and prints the content of the book* *prints "Not Found", if book is not found*	`O(logn)`

Starter Code:

```
#include <iostream>
#include "Book.h"
#include "BookstoreManager.h"

using namespace std;

int main() {
    BookstoreManager bookstoreManager;

    //prints true if the bookstore is empty
    bookstoreManager.isEmpty();

    //insert 4 books
    string title, authors, publisher;
    int isbn;
    for(int i=0;i<4;i++){
        cout<<"Enter book title:";
        cin>>title;
        cout<<"Enter authors:";
        cin>>authors;
        cout<<"Enter isbn:";
        cin>>isbn;
        cout<<"Enter publisher";
        cin>>publisher;
        Book aBook(title, isbn, authors, publisher);
        bookstoreManager.insert(aBook);
        cout<<endl;
    }

    //print bookstore
    bookstoreManager.print();

    //search for books
    cout<<”Searching…”<<endl;
    cout<<"ISBN:";
    cin>>isbn;
    Book b2(isbn);
    bookstoreManager.search(b2);

    //remove a book
    cout<<”Removing…”<<endl;
    cout<<"ISBN:";
    cin>>isbn;
    Book b1(isbn);
    bookstoreManager.remove(b1);

    //print bookstore
    bookstoreManager.print();

    //remove books from a particular publisher
    cout<<”Removing publisher”<<endl;
    cout<<"Publisher:";
```

```
    cin>>publisher;
    bookstoreManager.removePublisher(publisher);

    //print bookstore
    bookstoreManager.print();


    //prints the number of books
    bookstoreManager.listSize();

}
```

Sample Output:

true

Enter book title:**C++: Programming Basics**
Enter authors:**Nathan Clark**
Enter ISBN:**154296**
Enter publisher:**CreateSpace**

Enter book title:**Data Structures & Algorithm Analysis in C++**
Enter authors:**Mark Weiss**
Enter ISBN:**132847**
Enter publisher:**Pearson**

Enter book title:**Introduction to Programming Using Python**
Enter authors:**Daniel Liang**
Enter ISBN:**147231**
Enter publisher:**Pearson**

Enter book title:**Introduction to Algorithms**
Enter authors:**Thomas H. Cormen , Charles E. Leiserson**
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Sample Code

```
#include <iostream>
#include "Book.h"
#include "BookstoreManager.h"

using namespace std;

int main() {
   BookstoreManager bookstoreManager;

   //prints true if the bookstore is empty
   bookstoreManager.isEmpty();

   //insert 4 books
   string title, authors, publisher;
   int isbn;
   for(int i=0;i<4;i++){
      cout<<"Enter book title:";
      cin>>title;
      cout<<"Enter authors:";
      cin>>authors;
      cout<<"Enter isbn:";
      cin>>isbn;
      cout<<"Enter publisher";
      cin>>publisher;
      Book aBook(title, isbn, authors, publisher);
      bookstoreManager.insert(aBook);
      cout<<endl;
   }


   //print bookstore
   bookstoreManager.print();


   //search for books
   cout<<"Searching…"<<endl;
   cout<<"ISBN:";
   cin>>isbn;
   Book b2(isbn);
   bookstoreManager.search(b2);

   //remove a book
```

Sample Output

true

Enter book title:**C++: Programming Basics**
Enter authors:**Nathan Clark**
Enter ISBN:**154296**
Enter publisher:**CreateSpace**

Enter book title:**Data Structures & Algorithm Analysis in C++**
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Searching…
ISBN: **147231**
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Daniel Liang
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```
    cout<<"Removing…"<<endl;
    cout<<"ISBN:";
    cin>>isbn;
    Book b1(isbn);
    bookstoreManager.remove(b1);

    //print bookstore
    bookstoreManager.print();


    //remove books from a particular publisher
    cout<<"Removing publisher"<<endl;
    cout<<"Publisher:";
    cin>>publisher;
    bookstoreManager.removePublisher(publisher);


    //print bookstore
    bookstoreManager.print();


    //prints the number of books
    bookstoreManager.listSize();


}
```

```
Removing…
ISBN: 154296

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```