Military Institute of Science & Technology (MIST)
Department of Computer Science and Engineering
Assignment on BST, Course: CSE 204: Data Structure & Algorithm I Sessional

NB: Name the Assignment as yourStudentID_BST.cpp. For example, 202014005_BST.cpp. Submit only the .cpp file using the "turn in" option in the classroom. Do not submit multiple files or zip files.

<table>
<tr><th>No</th><th>Question</th><th>Marks</th></tr>
<tr><td>1.</td><td>
Create a program to manage the inventory of a bookstore. The bookstore has a large collection of books, and you need to implement a binary search tree (BST) to store and retrieve book information efficiently.

Each book has the following attributes:

ISBN (a unique identifier for the book)

Title

Author

Price

Quantity (number of copies available in the inventory)

Your program should support the following operations:

Add a book to the inventory: Given the book's details, add it to the BST.

Remove a book from the inventory: Given the ISBN, remove the book from the BST.

Update the quantity of a book: Given the ISBN and a new quantity, update the book's quantity in the BST.

Search for a book by ISBN: Given the ISBN, retrieve and display the book's details.

Display all books in the inventory: Traverse the BST and display the details of all books in the inventory.

Your implementation should ensure the BST remains balanced to search, insert, and delete books. The books should be sorted in the BST based on their ISBN.

Note: You can assume that the ISBNs are unique and don't need to handle duplicate ISBNs in the inventory.

<table>
<tr><th>Sample Input - Output</th></tr>
<tr><td>
Welcome to the Bookstore Inventory Management System!

1. Add a book to the inventory
2. Remove a book from the inventory
3. Update the quantity of a book
4. Search for a book by ISBN
5. Display all books in the inventory
7. Exit

Enter your choice: 1

Enter the book's ISBN: 9780132350884
Enter the book's title: Clean Code
Enter the book's author: Robert C. Martin
Enter the book's price: 39.99
Enter the book's quantity: 10

Book added to the inventory successfully.

Enter your choice: 1

Enter the book's ISBN: 9780201633610
Enter the book's title: Design Patterns
Enter the book's author: Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides
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Enter the book's price: 49.99
Enter the book's quantity: 5

Book added to the inventory successfully.

Enter your choice: 4

Enter the ISBN of the book to search: 9780132350884

ISBN: 9780132350884
Title: Clean Code
Author: Robert C. Martin
Price: $39.99
Quantity: 10



Enter your choice: 5

Inventory:

ISBN: 9780132350884
Title: Clean Code
Author: Robert C. Martin
Price: $39.99
Quantity: 10

ISBN: 9780201633610
Title: Design Patterns
Author: Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides
Price: $49.99
Quantity: 5

Enter your choice: 2

Enter the ISBN of the book to remove: 9780201633610

Book removed from the inventory successfully.

Enter your choice: 6

Inventory:

ISBN: 9780132350884
Title: Clean Code
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