CSC248 – Fundamentals of Data Structure
Academic Session October 2023 – February 2024
Lab Assignment 7 – Binary Search Tree

Course Outcomes (CO)	LO1	LO2	LO3
CO1			
CO2	√	√	√
CO3			

1. Given the following `Book`, `TreeNode` and `bookRecord` ADTs:

```
class Book
{
   private int serialNum;
   private String title;
   private String author;
   private char code;
   private String publisher;
   private int year;

   public Book()
   { }

   public setData(int sn,String t,String a,char c,String p, int y)
   {
         //method definition
   }

   public int getSerialNum() {  return serialNum;  }
   public String getTitle()  {  return title;  }
   public String getAuthor()  {  return author;  }
   public char getCode()  {  return code;  }
   public String getPublisher()  {   return publisher;  }
   public int getYear()  {  return year;  }
}

class TreeNode
{
   // data declaration

   public TreeNode(object elem)
   {
         //method definition
   }

   public void insert(object elem)
   {
         //method definition
   }
}
```

```
public class bookRecord
{
   private TreeNode root;

   public bookRecord(){ }          //constructor
   public void countBookCode()     //to count the number of books for
                                   //every code
   {
         //method definition
   }

   public void searchBook(int)     //to search a book based on
                                   //searching index
   {
         //method definition
   }

   public void displayAll()              //display book information
   {
         //method definition
   }
         ……
         ……
}
```

The information to be stored in the `bookRecord` are serial number, book title, author, publisher, year of the book published. For example, you are given the following data.

SerialNum	Title	Author	Code	Publisher	Year
1217	Bunga Dedap	Daud Kamal	A	Sejana	1998
1324	Fizik	Prof. Bun Tat	C	Mc Graw	2000
1001	Kimia	Prof. Kamarul	C	Anderson	2001
1009	Botani	Puan Salmah	E	Mutiara	1999
0781	Komputer	Dr Abu	D	Deitel	2001
4320	Sosial	Dr Kamariah	B	Mutiara	1998
2700	Ilmu Alam	Dr Kamarudin	A	Mutiara	1999
1243	Sejarah	Puan Kalsom	B	Tamadun	1989

a) Write a complete program for above classes to make the binary search tree can be implemented. Then. Store some data in the binary search tree based on `SerialNum`.

b) Write the definition for `countBookCode` to count and return the number of book for book code A, B, C and D in the tree.

c) Write the definition for `searchBook` to display the book information based on the `SerialNum`.

d) Write the definition for `displayAll` to display all the book information in BST.

2. By referring to the **Final Assessment Paper (FEBRUARY 2023), QUESTION 3 (b)**. Write a complete Java program.

3. By referring to the **Final Assessment Paper (JULY 2023), QUESTION 3 (b)**. Write a complete Java program.