Programming Project 5 – Binary Search Tree Implementation

Note: When you turn in an assignment to be graded in this class, you are making the claim that you neither gave nor received assistance on the work you turned in (except, of course, assistance from your instructor). Any assistance from other sources, including the internet, is an honor code violation.

In this project you will implement a Binary Search Tree using **`bridges.base.BinTreeElement<E>`** as the node and by implementing the provided **`BinTreeInterface<E>`**.

1. Provide an implementation of the **`BinTreeInterface<E>`**interface as a class named **`BinSearchTree`**
2. In the **`BinSearchTree`** class, implement the following new methods:
   - `/** Return the height of this binary tree */`

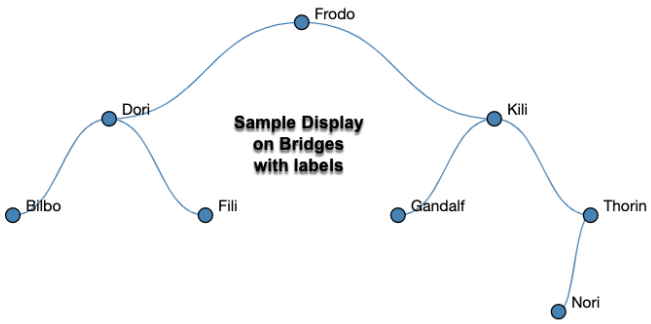
     `public int height()`
   - `/** Returns true if the tree is a full binary tree */`

     `public boolean isFullBST()`
   - `/** Return the number of leaf nodes */`

     `public int getNumberOfLeaves()`
   - `/** Return the number of non-leaf nodes */`

     `public int getNumberOfNonLeaves()`
3. Include a main method that adds the following elements to the tree and visualize the tree in Bridges:

```
BinSearchTree <String> names = new BinSearchTree<>();
names.add("Frodo");
names.add("Dori");
names.add("Bilbo");
names.add("Kili");
names.add("Gandalf");
names.add("Fili");
names.add("Thorin");
names.add("Nori ");
```



Upload the URL for your visualization along with a screenshot that includes your webpage with a title and your name using the setTitle and/or setDescription mehods on your Bridges object.

Your file must be written in package – **`cmsc256`**. Upload only the **`BinSearchTree`** class to Gradescope for grading.

Follow the Coding Style Guideline in Blackboard and include a comment block that includes your name, the name of the project along with the file name and a brief description of the purpose of the class at the top of **the source code file that you submit**.

Ask questions about any part of the programming project that is not clear.