CS 314 Exam Review — Get Grandparent
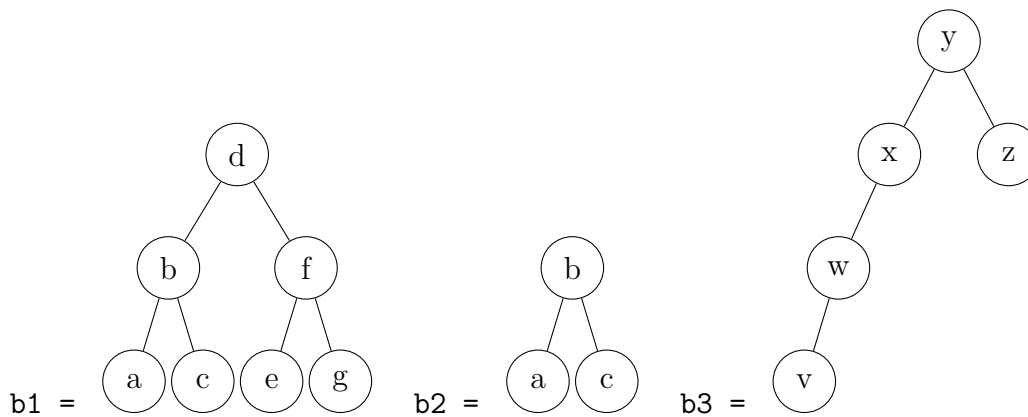
Binary Trees

Write an instance method for a BinarySearchTree which, given an element returns that element's grandparent in the tree. If the given element is not in the tree, return `null`. If the element does not have a grandparent (i.e. the element is not deep enough), return the root element.

Complete the following method.

```
// Returns the grandparent of 'data'
// pre: data != null
// post: This tree shall not be altered by this operation
public E getGrandparent(E data){
```

Here are some sample calls to `getGrandparent`:

b1.getGrandparent('a') $\rightarrow$ 'd'   b1.getGrandparent('g') $\rightarrow$ 'd'
b2.getGrandparent('b') $\rightarrow$ 'b'   b2.getGrandparent('c') $\rightarrow$ 'b'
b3.getGrandparent('a') $\rightarrow$ null   b3.getGrandparent('v') $\rightarrow$ 'x'

You may use the following BinaryTree implementation

```
public class BinarySearchTree<E extends Comparable<? super E>>{
  BSTNode<E> root;
  int size;

  //Nested node class
  private static class BSTNode<E>{
    BNode<E> left, right;
    E data;
  }
}
```

Do not create any new data structures or use any other Java classes or methods.

```java
// Returns the grandparent of 'data'
// pre: data != null
// post: This tree shall not be altered by this operation
public E getGrandparent(E data){
```