Create the class AVLTree <T> and the supporting inner class AVLNode .

Following considerations in Lec8c, the class AVLNode has the following attributes :

T data, AVLNode leftChild, AVLNode rightChild, int leftHeight, int rightHeight, int height.

Since the AVLNode has attribute *height*, the method getHeight can just return this value: it is an accessor method. You should also create a recursive version (e.g. getRealHeight or getTreeHeight). It will be used for verification purpose.

The class AVLTree <T> has only one attribute (private field): AVLNode <T> root.

The class AVLTree must have the standard tree methods: isEmpty, getNumberOfNodes, getHeight, clear; the methods contains (T entry) (another name for searching) and insert (T entry) (another name for add). As AVLTree is a binary search tree, the generic T must be comparable.

As is always the case for trees, the method getHeight for a tree returns getHeight for the root.

The private methods llRotate, lrRotate, rrRotate, rlRotate should also be created, as well as some other methods you feel needed.

You also need to create at least two iterators: InOrderIterator and LevelOrderIterator.

As a demo program, fill the tree with the names of capitals of United States (or European or Asian countries). Use the attached sample files.

Output the tree height, inorder traversal (to check the binary search tree properties) and levelorder traversal (to see the root and children).