

At this lab section, we will learn
implementation of AVL Trees.

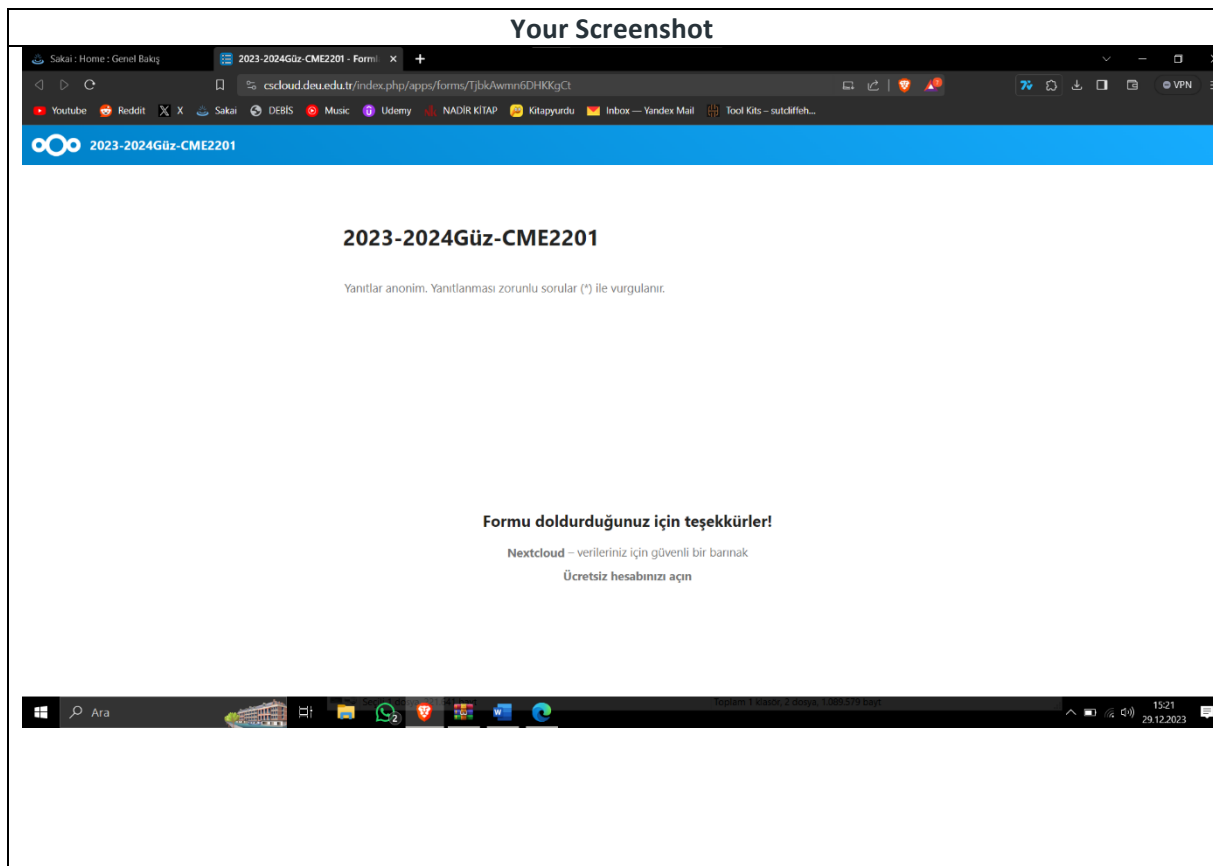
AVL Trees

Asst. Prof. Dr. Feriştah DALKILIÇ
Res. Asst. Fatih DİCLE

PART 1 – Course Questionnaire

Fill out the survey in the link below and paste the screenshot showing that you have completed it.

<https://cscloud.deu.edu.tr/index.php/apps/forms/TjbkAwmn6DHKKgCt>



PART 2 – AVL Tree

You can form several differently shaped binary search trees from the same collection of data. Some of these trees will be balanced and some will not. You could take an unbalanced binary search tree and rearrange its nodes to get a balanced binary search tree.

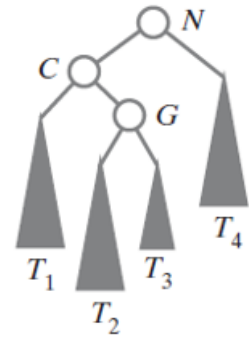
Every node in a balanced binary tree has subtrees whose heights differ by no more than 1.

The AVL tree is a binary search tree that rearranges its nodes whenever it becomes unbalanced. The balance of a binary search tree is upset only when you add or remove a node. Thus, during these operations, the AVL tree rearranges nodes as necessary to maintain its balance.

Steps to follow for insertion

Let the newly inserted node be W

- 1) Perform standard BST insert for W.
- 2) Starting from W, travel up and find the first unbalanced node. Let N be the first unbalanced node, C be the child of N that comes on the path from W to N and G be the grandchild of N that comes on the path from W to N.
- 3) Re-balance the tree by performing appropriate rotations on the subtree rooted with N.



There can be 4 possible cases that need to be handled as G, C and N can be arranged in 4 ways. Following are the possible 4 arrangements:

- a) C is left child of N and G is left child of C (**Left Left Case**) – (**Single Right Rotation**)
- b) C is left child of N and G is right child of C (**Left Right Case**) – (**Left Right Rotation**)
- c) C is right child of N and G is right child of C (**Right Right Case**) – (**Single Left Rotation**)
- d) C is right child of N and G is left child of C (**Right Left Case**) – (**Right Left Rotation**)

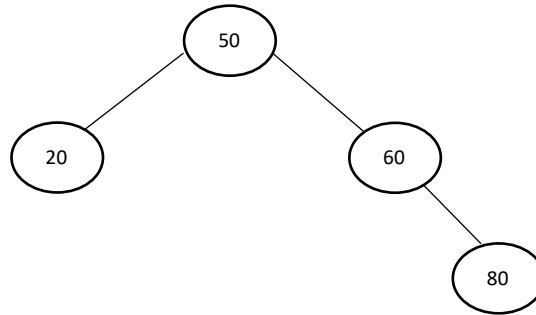
Example:

Insert items to the AVL tree.

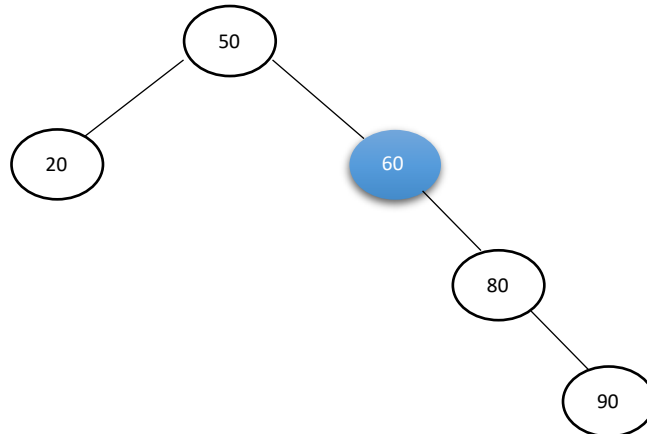
Items = [60, 50, 20, 80, 90, 70, 55, 10, 40, 35]

STEP 1 Add 60	
STEP 2 Add 50	
STEP 3 Add 20, unbalanced tree	<div> Right Rotation </div>

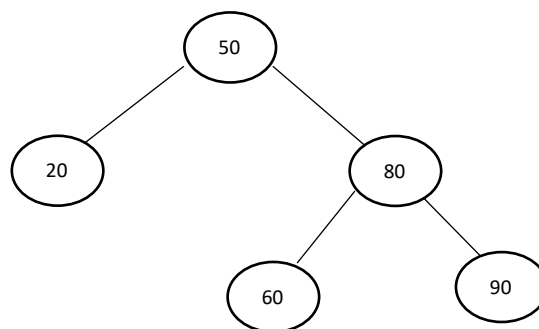
STEP 4
Add 80



STEP 5
Add 90, unbalanced tree

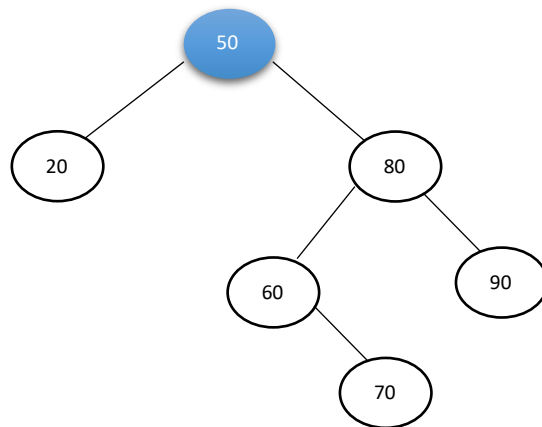


Left Rotation



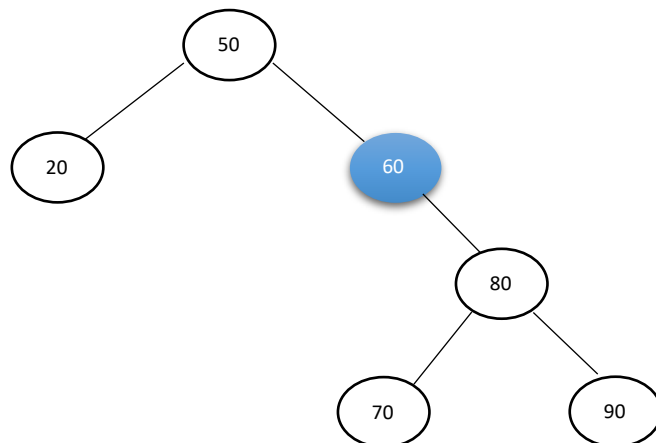
STEP 6

Add 70, unbalanced tree

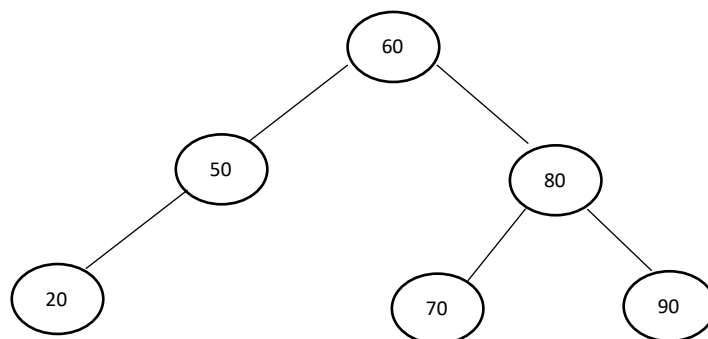
**STEP 6**

Right-left rotation

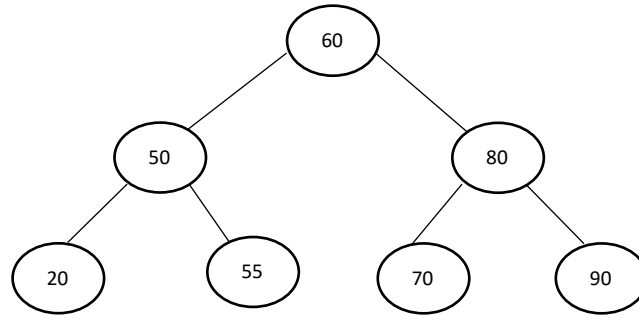
1) *Right Rotation*



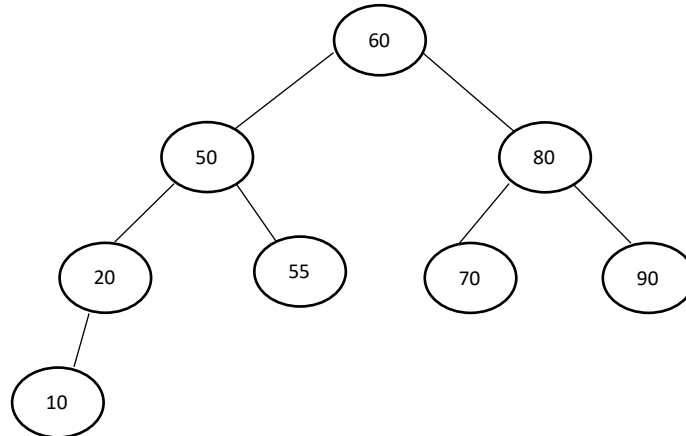
2) *Left Rotation*



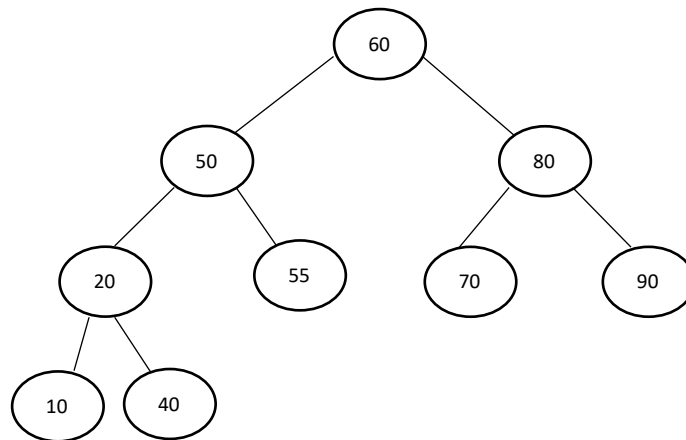
STEP 7
Add 55



STEP 8
Add 10

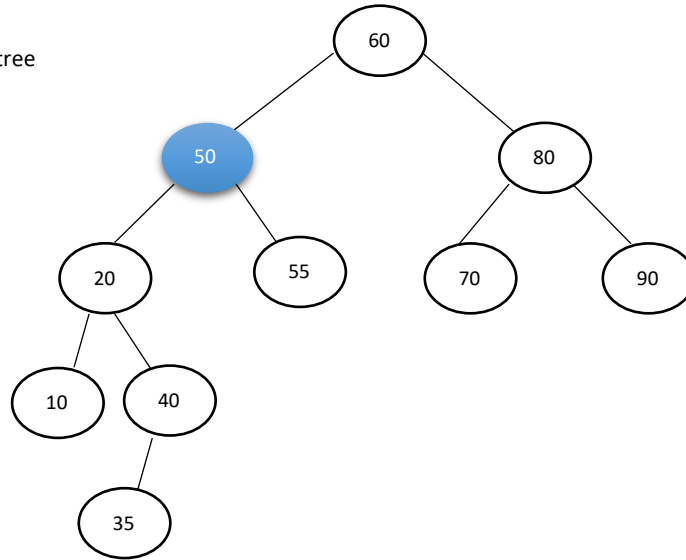


STEP 9
Add 40



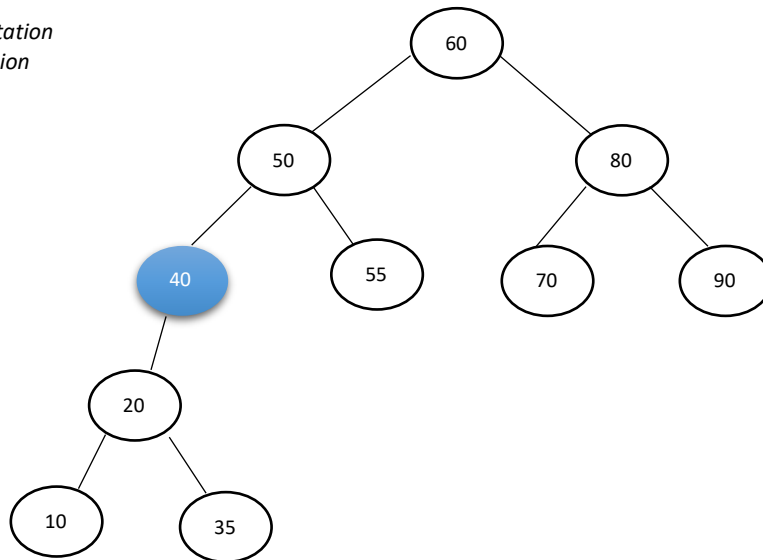
STEP 10

Add 35, unbalanced tree

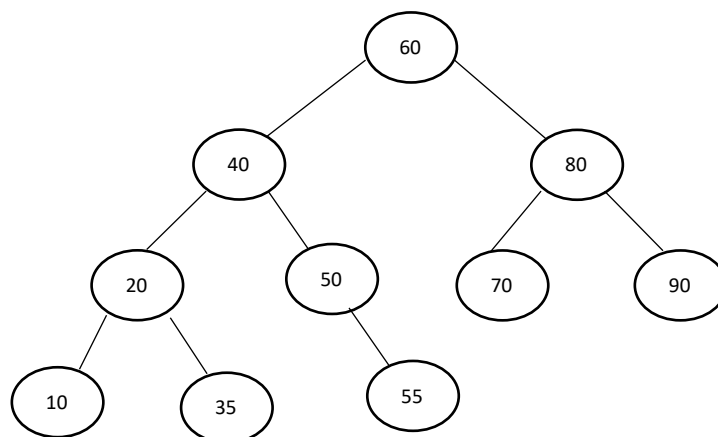
**STEP 10**

Left-right Rotation

1) *Left Rotation*



2) *Right Rotation*



Exercise - 1

At this section, you will experiment some operations on both a binary search tree and an AVL Tree in Java.

Step – 1

Create a new Java project and add the given classes in *src* folder into your project.

Step – 2

Fill in the missing parts in *rotateLeft* and *rotateLeftRight* methods of *AVLTree.java*.

Step – 3

Add a new class with the name *Test.java*. Create a *BinarySearchTree* instance. Read the given input file *shuffled_numbers_100K.txt* and insert all the numbers into BST.

Step – 4

Create an *AVLTree* instance. Read the given input file *shuffled_numbers_100K.txt* again and insert all the numbers into AVL Tree.

Step – 5

Read the file *search_1K.txt* and search all the numbers in the BST.

Step – 6

Search for the same 1K numbers in the AVL Tree, as well.

Step – 7

Complete the table given below by measuring the performance of specified operations.

Hint: You can use the following code to measure the time spent (in millisecond) for an operation.

```
long StartTimer = System.nanoTime();
//perform your operation here
double timeDiff = (System.nanoTime() - StartTimer)/1000000;
```

Data Structure	Total Indexing Time for 100K Numbers	Final Height of the Tree	Total Searching Time for 1K Numbers	Successful Search Count	Unsuccessful Search Count
BST	?	?	?	?	?
AVL Tree	?	?	?	?	?

Step – 8

Paste the content of *Test.java* and your final output.

Your Test.java
import java.io.BufferedReader;


```

import java.io.FileReader;
import java.io.IOException;
import java.sql.SQLOutput;
public class Test {
    public static void main(String[] args){
        BinarySearchTree<Integer> bst = new BinarySearchTree<>();
        String fileName = "shuffled_numbers_100K.txt";
        try (BufferedReader br = new BufferedReader(new
        FileReader(fileName))) {
            String line;
            while ((line = br.readLine()) != null) {
                // Assuming each line contains one number
                int number = Integer.parseInt(line.trim());
                bst.add(number);
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
        // Creating AVLTree instance
        AVLTree<Integer> avlTree = new AVLTree<>();
        // Reading and inserting numbers into AVLTree
        try (BufferedReader br = new BufferedReader(new
        FileReader(fileName))) {
            String line;
            while ((line = br.readLine()) != null) {
                int number = Integer.parseInt(line.trim());
                avlTree.add(number);
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
        //perform your operation here
        double timeDiff = 0;
        long StartTimer = 0;
        // Searching for numbers in the search_1K.txt file in BST
        String searchFileName = "search_1K.txt";
        try (BufferedReader br = new BufferedReader(new
        FileReader(searchFileName))) {
            String line;
            StartTimer = System.nanoTime();
            while ((line = br.readLine()) != null) {
                int number = Integer.parseInt(line.trim());
                boolean found = bst.contains(number);
                System.out.println("Number " + number + " found in BST: "
                + found);
            }
            timeDiff= (System.nanoTime() - StartTimer)/1000000;
            System.out.println(timeDiff);
        }
    }
}

```

```

    } catch (IOException e) {
        e.printStackTrace();
    }
    System.out.println();
    // Reading and searching numbers in search_1K.txt in AVLTree
    double timeDiff2 = 0;
    long StartTimer2 = 0;
    String searchFileName2 = "search_1K.txt";
    try (BufferedReader br = new BufferedReader(new
    FileReader(searchFileName2))) {
        String line;
        while ((line = br.readLine()) != null) {
            int numberToSearch = Integer.parseInt(line.trim());
            boolean found = avlTree.contains(numberToSearch);
            System.out.println("Number " + numberToSearch + " found
            in AVL Tree: " + found);
        }
        timeDiff2= (System.nanoTime() - StartTimer2)/1000000;
        System.out.println(timeDiff2);
    } catch (IOException e) {
        e.printStackTrace();
    }
}
}
}

```

Your Output

```

Number 23911 found in BST: true
Number 78554 found in BST: true
Number 58975 found in BST: true
Number 8123 found in BST: true
Number 46762 found in BST: true
Number 12599 found in BST: true
Number 60281 found in BST: true
Number 52104 found in BST: true
Number 16524 found in BST: true
Number 37916 found in BST: true
Number 3891 found in BST: true
Number 100631 found in BST: false
Number 36300 found in BST: true
Number 58104 found in BST: true
Number 98332 found in BST: true
Number 29258 found in BST: true
Number 96225 found in BST: true
Number 9559 found in BST: true
Number 72 found in BST: true
Number 99155 found in BST: true

```

Number 4853 found in BST: true
Number 38112 found in BST: true
Number 92492 found in BST: true
Number 24230 found in BST: true
Number 28260 found in BST: true
Number 100198 found in BST: false
Number 3596 found in BST: true
Number 92172 found in BST: true
Number 15004 found in BST: true
Number 6813 found in BST: true
Number 65021 found in BST: true
Number 64758 found in BST: true
Number 55338 found in BST: true
Number 3928 found in BST: true
Number 60975 found in BST: true
Number 5235 found in BST: true
Number 67231 found in BST: true
Number 73938 found in BST: true
Number 16857 found in BST: true
Number 20992 found in BST: true
Number 38602 found in BST: true
Number 43390 found in BST: true
Number 44686 found in BST: true
Number 25646 found in BST: true
Number 54330 found in BST: true
Number 106672 found in BST: false
Number 18981 found in BST: true
Number 4910 found in BST: true
Number 91159 found in BST: true
Number 105313 found in BST: false
Number 11598 found in BST: true
Number 40959 found in BST: true
Number 20025 found in BST: true
Number 22123 found in BST: true
Number 6125 found in BST: true
Number 35331 found in BST: true
Number 95915 found in BST: true
Number 15530 found in BST: true
Number 47978 found in BST: true
Number 68860 found in BST: true
Number 48056 found in BST: true
Number 37038 found in BST: true
Number 46947 found in BST: true
Number 2489 found in BST: true
Number 66219 found in BST: true
Number 61821 found in BST: true
Number 40267 found in BST: true
Number 88684 found in BST: true

Number 39805 found in BST: true
Number 43097 found in BST: true
Number 52418 found in BST: true
Number 11405 found in BST: true
Number 49004 found in BST: true
Number 41075 found in BST: true
Number 87250 found in BST: true
Number 62469 found in BST: true
Number 7366 found in BST: true
Number 44961 found in BST: true
Number 61751 found in BST: true
Number 101703 found in BST: false
Number 34763 found in BST: true
Number 56166 found in BST: true
Number 52185 found in BST: true
Number 40097 found in BST: true
Number 45381 found in BST: true
Number 29777 found in BST: true
Number 90819 found in BST: true
Number 17796 found in BST: true
Number 84758 found in BST: true
Number 98214 found in BST: true
Number 86551 found in BST: true
Number 29146 found in BST: true
Number 75106 found in BST: true
Number 79570 found in BST: true
Number 51410 found in BST: true
Number 65987 found in BST: true
Number 25751 found in BST: true
Number 40659 found in BST: true
Number 94463 found in BST: true
Number 97380 found in BST: true
Number 52395 found in BST: true
Number 48767 found in BST: true
Number 73499 found in BST: true
Number 109807 found in BST: false
Number 78692 found in BST: true
Number 9237 found in BST: true
Number 28082 found in BST: true
Number 15151 found in BST: true
Number 31878 found in BST: true
Number 61511 found in BST: true
Number 58341 found in BST: true
Number 4179 found in BST: true
Number 75637 found in BST: true
Number 38465 found in BST: true
Number 82890 found in BST: true
Number 13545 found in BST: true

Number 16296 found in BST: true
Number 88199 found in BST: true
Number 35828 found in BST: true
Number 37325 found in BST: true
Number 19966 found in BST: true
Number 89595 found in BST: true
Number 10066 found in BST: true
Number 98669 found in BST: true
Number 77545 found in BST: true
Number 35139 found in BST: true
Number 76418 found in BST: true
Number 26685 found in BST: true
Number 19972 found in BST: true
Number 17938 found in BST: true
Number 97951 found in BST: true
Number 40683 found in BST: true
Number 49388 found in BST: true
Number 57925 found in BST: true
Number 95070 found in BST: true
Number 12602 found in BST: true
Number 37637 found in BST: true
Number 13504 found in BST: true
Number 37996 found in BST: true
Number 64479 found in BST: true
Number 20252 found in BST: true
Number 53401 found in BST: true
Number 74948 found in BST: true
Number 105542 found in BST: false
Number 108294 found in BST: false
Number 17451 found in BST: true
Number 52127 found in BST: true
Number 47936 found in BST: true
Number 95558 found in BST: true
Number 98010 found in BST: true
Number 7530 found in BST: true
Number 35562 found in BST: true
Number 48505 found in BST: true
Number 74121 found in BST: true
Number 22521 found in BST: true
Number 87170 found in BST: true
Number 70289 found in BST: true
Number 12069 found in BST: true
Number 34707 found in BST: true
Number 46747 found in BST: true
Number 34814 found in BST: true
Number 37893 found in BST: true
Number 5445 found in BST: true
Number 60328 found in BST: true

Number 35209 found in BST: true
Number 15730 found in BST: true
Number 25400 found in BST: true
Number 50433 found in BST: true
Number 31119 found in BST: true
Number 8936 found in BST: true
Number 63182 found in BST: true
Number 45615 found in BST: true
Number 56930 found in BST: true
Number 37796 found in BST: true
Number 106591 found in BST: false
Number 16916 found in BST: true
Number 9466 found in BST: true
Number 64031 found in BST: true
Number 62636 found in BST: true
Number 65523 found in BST: true
Number 29668 found in BST: true
Number 20810 found in BST: true
Number 5649 found in BST: true
Number 37348 found in BST: true
Number 60785 found in BST: true
Number 33348 found in BST: true
Number 67978 found in BST: true
Number 11714 found in BST: true
Number 26803 found in BST: true
Number 101603 found in BST: false
Number 10718 found in BST: true
Number 10206 found in BST: true
Number 92668 found in BST: true
Number 77277 found in BST: true
Number 95213 found in BST: true
Number 44111 found in BST: true
Number 100396 found in BST: false
Number 102966 found in BST: false
Number 40226 found in BST: true
Number 84469 found in BST: true
Number 79629 found in BST: true
Number 21190 found in BST: true
Number 84801 found in BST: true
Number 60473 found in BST: true
Number 17492 found in BST: true
Number 64868 found in BST: true
Number 103819 found in BST: false
Number 16677 found in BST: true
Number 19647 found in BST: true
Number 51219 found in BST: true
Number 95248 found in BST: true
Number 44344 found in BST: true

Number 95155 found in BST: true
Number 28163 found in BST: true
Number 49498 found in BST: true
Number 87152 found in BST: true
Number 3309 found in BST: true
Number 34409 found in BST: true
Number 81526 found in BST: true
Number 178 found in BST: true
Number 53593 found in BST: true
Number 65000 found in BST: true
Number 32337 found in BST: true
Number 29456 found in BST: true
Number 92577 found in BST: true
Number 66136 found in BST: true
Number 56852 found in BST: true
Number 74476 found in BST: true
Number 7722 found in BST: true
Number 26384 found in BST: true
Number 2683 found in BST: true
Number 85437 found in BST: true
Number 109184 found in BST: false
Number 24793 found in BST: true
Number 70544 found in BST: true
Number 62291 found in BST: true
Number 102634 found in BST: false
Number 94436 found in BST: true
Number 55053 found in BST: true
Number 6826 found in BST: true
Number 49095 found in BST: true
Number 69921 found in BST: true
Number 38411 found in BST: true
Number 54480 found in BST: true
Number 50505 found in BST: true
Number 48983 found in BST: true
Number 16414 found in BST: true
Number 102013 found in BST: false
Number 82791 found in BST: true
Number 45939 found in BST: true
Number 71632 found in BST: true
Number 16739 found in BST: true
Number 52283 found in BST: true
Number 57857 found in BST: true
Number 1136 found in BST: true
Number 108521 found in BST: false
Number 61300 found in BST: true
Number 98705 found in BST: true
Number 91919 found in BST: true
Number 93742 found in BST: true

Number 104428 found in BST: false
Number 39850 found in BST: true
Number 43922 found in BST: true
Number 19622 found in BST: true
Number 63185 found in BST: true
Number 30951 found in BST: true
Number 3750 found in BST: true
Number 86382 found in BST: true
Number 55557 found in BST: true
Number 62515 found in BST: true
Number 22767 found in BST: true
Number 6121 found in BST: true
Number 56975 found in BST: true
Number 70993 found in BST: true
Number 48754 found in BST: true
Number 104733 found in BST: false
Number 72378 found in BST: true
Number 77490 found in BST: true
Number 16431 found in BST: true
Number 63490 found in BST: true
Number 89373 found in BST: true
Number 95223 found in BST: true
Number 86169 found in BST: true
Number 93356 found in BST: true
Number 83650 found in BST: true
Number 94974 found in BST: true
Number 95665 found in BST: true
Number 56085 found in BST: true
Number 86695 found in BST: true
Number 102974 found in BST: false
Number 56269 found in BST: true
Number 57061 found in BST: true
Number 63853 found in BST: true
Number 45687 found in BST: true
Number 39362 found in BST: true
Number 98185 found in BST: true
Number 77220 found in BST: true
Number 8780 found in BST: true
Number 8492 found in BST: true
Number 35693 found in BST: true
Number 31768 found in BST: true
Number 28283 found in BST: true
Number 12969 found in BST: true
Number 109302 found in BST: false
Number 50168 found in BST: true
Number 42614 found in BST: true
Number 10667 found in BST: true
Number 104672 found in BST: false

Number 3923 found in BST: true
Number 66597 found in BST: true
Number 80476 found in BST: true
Number 76085 found in BST: true
Number 97875 found in BST: true
Number 23232 found in BST: true
Number 62448 found in BST: true
Number 99825 found in BST: true
Number 41203 found in BST: true
Number 34699 found in BST: true
Number 86530 found in BST: true
Number 79883 found in BST: true
Number 36690 found in BST: true
Number 875 found in BST: true
Number 41827 found in BST: true
Number 26943 found in BST: true
Number 94109 found in BST: true
Number 107980 found in BST: false
Number 54161 found in BST: true
Number 38878 found in BST: true
Number 93417 found in BST: true
Number 80482 found in BST: true
Number 50421 found in BST: true
Number 68309 found in BST: true
Number 82080 found in BST: true
Number 13771 found in BST: true
Number 85486 found in BST: true
Number 11317 found in BST: true
Number 66694 found in BST: true
Number 7265 found in BST: true
Number 11507 found in BST: true
Number 76524 found in BST: true
Number 78468 found in BST: true
Number 85230 found in BST: true
Number 71105 found in BST: true
Number 104486 found in BST: false
Number 66780 found in BST: true
Number 56547 found in BST: true
Number 60328 found in BST: true
Number 68590 found in BST: true
Number 69780 found in BST: true
Number 90855 found in BST: true
Number 76996 found in BST: true
Number 88240 found in BST: true
Number 92692 found in BST: true
Number 81601 found in BST: true
Number 24594 found in BST: true
Number 51419 found in BST: true

Number 37128 found in BST: true
Number 73351 found in BST: true
Number 44395 found in BST: true
Number 91941 found in BST: true
Number 1007 found in BST: true
Number 76744 found in BST: true
Number 109938 found in BST: false
Number 15975 found in BST: true
Number 80408 found in BST: true
Number 64269 found in BST: true
Number 92242 found in BST: true
Number 76282 found in BST: true
Number 36265 found in BST: true
Number 109777 found in BST: false
Number 66461 found in BST: true
Number 85590 found in BST: true
Number 30344 found in BST: true
Number 12700 found in BST: true
Number 105066 found in BST: false
Number 108065 found in BST: false
Number 64625 found in BST: true
Number 49938 found in BST: true
Number 91222 found in BST: true
Number 31272 found in BST: true
Number 13796 found in BST: true
Number 8016 found in BST: true
Number 17569 found in BST: true
Number 96139 found in BST: true
Number 46463 found in BST: true
Number 10546 found in BST: true
Number 105288 found in BST: false
Number 60363 found in BST: true
Number 41350 found in BST: true
Number 54653 found in BST: true
Number 63544 found in BST: true
Number 7007 found in BST: true
Number 31378 found in BST: true
Number 12635 found in BST: true
Number 67614 found in BST: true
Number 35804 found in BST: true
Number 64048 found in BST: true
Number 18697 found in BST: true
Number 24416 found in BST: true
Number 11570 found in BST: true
Number 17822 found in BST: true
Number 94984 found in BST: true
Number 33442 found in BST: true
Number 34861 found in BST: true

Number 5161 found in BST: true
Number 21513 found in BST: true
Number 32690 found in BST: true
Number 14273 found in BST: true
Number 18773 found in BST: true
Number 91543 found in BST: true
Number 69188 found in BST: true
Number 77047 found in BST: true
Number 93735 found in BST: true
Number 92744 found in BST: true
Number 11014 found in BST: true
Number 18064 found in BST: true
Number 83253 found in BST: true
Number 22833 found in BST: true
Number 79564 found in BST: true
Number 62302 found in BST: true
Number 106162 found in BST: false
Number 45225 found in BST: true
Number 38579 found in BST: true
Number 27225 found in BST: true
Number 18635 found in BST: true
Number 63510 found in BST: true
Number 31013 found in BST: true
Number 35532 found in BST: true
Number 3111 found in BST: true
Number 74307 found in BST: true
Number 74444 found in BST: true
Number 9603 found in BST: true
Number 97861 found in BST: true
Number 29893 found in BST: true
Number 32576 found in BST: true
Number 9570 found in BST: true
Number 35740 found in BST: true
Number 94811 found in BST: true
Number 80553 found in BST: true
Number 100302 found in BST: false
Number 10794 found in BST: true
Number 104154 found in BST: false
Number 12006 found in BST: true
Number 51038 found in BST: true
Number 68076 found in BST: true
Number 28972 found in BST: true
Number 89774 found in BST: true
Number 88656 found in BST: true
Number 9805 found in BST: true
Number 52402 found in BST: true
Number 4878 found in BST: true
Number 11724 found in BST: true

Number 14334 found in BST: true
Number 104634 found in BST: false
Number 108746 found in BST: false
Number 32145 found in BST: true
Number 67638 found in BST: true
Number 37100 found in BST: true
Number 10112 found in BST: true
Number 48004 found in BST: true
Number 94173 found in BST: true
Number 86937 found in BST: true
Number 93698 found in BST: true
Number 51420 found in BST: true
Number 28766 found in BST: true
Number 91635 found in BST: true
Number 81148 found in BST: true
Number 95071 found in BST: true
Number 55798 found in BST: true
Number 80139 found in BST: true
Number 96285 found in BST: true
Number 46397 found in BST: true
Number 31284 found in BST: true
Number 12361 found in BST: true
Number 40573 found in BST: true
Number 50739 found in BST: true
Number 52196 found in BST: true
Number 84634 found in BST: true
Number 35829 found in BST: true
Number 91753 found in BST: true
Number 2990 found in BST: true
Number 6164 found in BST: true
Number 42382 found in BST: true
Number 64861 found in BST: true
Number 94465 found in BST: true
Number 92587 found in BST: true
Number 53230 found in BST: true
Number 46328 found in BST: true
Number 20724 found in BST: true
Number 109274 found in BST: false
Number 108498 found in BST: false
Number 80835 found in BST: true
Number 7312 found in BST: true
Number 84177 found in BST: true
Number 720 found in BST: true
Number 69179 found in BST: true
Number 5852 found in BST: true
Number 80245 found in BST: true
Number 48512 found in BST: true
Number 62806 found in BST: true

Number 66371 found in BST: true
Number 75518 found in BST: true
Number 23101 found in BST: true
Number 82193 found in BST: true
Number 509 found in BST: true
Number 1844 found in BST: true
Number 26988 found in BST: true
Number 56602 found in BST: true
Number 50127 found in BST: true
Number 16883 found in BST: true
Number 107855 found in BST: false
Number 83882 found in BST: true
Number 4481 found in BST: true
Number 57416 found in BST: true
Number 6185 found in BST: true
Number 68431 found in BST: true
Number 6585 found in BST: true
Number 23856 found in BST: true
Number 71707 found in BST: true
Number 7179 found in BST: true
Number 106946 found in BST: false
Number 5802 found in BST: true
Number 12935 found in BST: true
Number 62232 found in BST: true
Number 63681 found in BST: true
Number 27291 found in BST: true
Number 92140 found in BST: true
Number 37370 found in BST: true
Number 97475 found in BST: true
Number 21288 found in BST: true
Number 6237 found in BST: true
Number 16571 found in BST: true
Number 44518 found in BST: true
Number 41244 found in BST: true
Number 44318 found in BST: true
Number 39780 found in BST: true
Number 95975 found in BST: true
Number 35033 found in BST: true
Number 57531 found in BST: true
Number 81832 found in BST: true
Number 1631 found in BST: true
Number 94588 found in BST: true
Number 55100 found in BST: true
Number 1854 found in BST: true
Number 59033 found in BST: true
Number 27706 found in BST: true
Number 81354 found in BST: true
Number 57797 found in BST: true

Number 82186 found in BST: true
Number 63784 found in BST: true
Number 34436 found in BST: true
Number 64518 found in BST: true
Number 73530 found in BST: true
Number 20601 found in BST: true
Number 95338 found in BST: true
Number 58488 found in BST: true
Number 63952 found in BST: true
Number 82436 found in BST: true
Number 52919 found in BST: true
Number 8615 found in BST: true
Number 40862 found in BST: true
Number 104391 found in BST: false
Number 37835 found in BST: true
Number 52425 found in BST: true
Number 73712 found in BST: true
Number 874 found in BST: true
Number 105297 found in BST: false
Number 51332 found in BST: true
Number 23769 found in BST: true
Number 104704 found in BST: false
Number 10646 found in BST: true
Number 76306 found in BST: true
Number 37331 found in BST: true
Number 21112 found in BST: true
Number 32946 found in BST: true
Number 33242 found in BST: true
Number 98616 found in BST: true
Number 6691 found in BST: true
Number 98279 found in BST: true
Number 74583 found in BST: true
Number 17502 found in BST: true
Number 30845 found in BST: true
Number 29626 found in BST: true
Number 104078 found in BST: false
Number 79778 found in BST: true
Number 86530 found in BST: true
Number 7715 found in BST: true
Number 14864 found in BST: true
Number 109739 found in BST: false
Number 47168 found in BST: true
Number 77009 found in BST: true
Number 31929 found in BST: true
Number 62802 found in BST: true
Number 9011 found in BST: true
Number 7299 found in BST: true
Number 41943 found in BST: true

Number 85272 found in BST: true
Number 27486 found in BST: true
Number 22332 found in BST: true
Number 12400 found in BST: true
Number 6446 found in BST: true
Number 88651 found in BST: true
Number 34604 found in BST: true
Number 8351 found in BST: true
Number 26085 found in BST: true
Number 72886 found in BST: true
Number 85293 found in BST: true
Number 103943 found in BST: false
Number 95994 found in BST: true
Number 29016 found in BST: true
Number 25918 found in BST: true
Number 60225 found in BST: true
Number 13573 found in BST: true
Number 57516 found in BST: true
Number 18997 found in BST: true
Number 76716 found in BST: true
Number 12113 found in BST: true
Number 43005 found in BST: true
Number 31688 found in BST: true
Number 59412 found in BST: true
Number 40722 found in BST: true
Number 66724 found in BST: true
Number 105494 found in BST: false
Number 37561 found in BST: true
Number 42082 found in BST: true
Number 1281 found in BST: true
Number 72935 found in BST: true
Number 98695 found in BST: true
Number 51867 found in BST: true
Number 11842 found in BST: true
Number 14020 found in BST: true
Number 59162 found in BST: true
Number 39181 found in BST: true
Number 40997 found in BST: true
Number 69137 found in BST: true
Number 41438 found in BST: true
Number 87437 found in BST: true
Number 63378 found in BST: true
Number 2847 found in BST: true
Number 36329 found in BST: true
Number 89870 found in BST: true
Number 25691 found in BST: true
Number 64258 found in BST: true
Number 48319 found in BST: true

Number 58197 found in BST: true
Number 30091 found in BST: true
Number 15039 found in BST: true
Number 103135 found in BST: false
Number 43445 found in BST: true
Number 27299 found in BST: true
Number 96259 found in BST: true
Number 101984 found in BST: false
Number 41933 found in BST: true
Number 5652 found in BST: true
Number 90611 found in BST: true
Number 3765 found in BST: true
Number 38532 found in BST: true
Number 29651 found in BST: true
Number 21573 found in BST: true
Number 80077 found in BST: true
Number 74412 found in BST: true
Number 75864 found in BST: true
Number 65924 found in BST: true
Number 41321 found in BST: true
Number 52849 found in BST: true
Number 51432 found in BST: true
Number 2997 found in BST: true
Number 71364 found in BST: true
Number 7736 found in BST: true
Number 104361 found in BST: false
Number 68962 found in BST: true
Number 12544 found in BST: true
Number 92753 found in BST: true
Number 58643 found in BST: true
Number 91015 found in BST: true
Number 32279 found in BST: true
Number 53289 found in BST: true
Number 29189 found in BST: true
Number 22741 found in BST: true
Number 1289 found in BST: true
Number 8303 found in BST: true
Number 59153 found in BST: true
Number 1896 found in BST: true
Number 82078 found in BST: true
Number 83958 found in BST: true
Number 14379 found in BST: true
Number 46388 found in BST: true
Number 48210 found in BST: true
Number 29972 found in BST: true
Number 8776 found in BST: true
Number 59496 found in BST: true
Number 11675 found in BST: true

Number 95106 found in BST: true
Number 91656 found in BST: true
Number 85812 found in BST: true
Number 5429 found in BST: true
Number 59592 found in BST: true
Number 81356 found in BST: true
Number 6546 found in BST: true
Number 34315 found in BST: true
Number 13857 found in BST: true
Number 42021 found in BST: true
Number 23244 found in BST: true
Number 109897 found in BST: false
Number 3496 found in BST: true
Number 7697 found in BST: true
Number 85481 found in BST: true
Number 72024 found in BST: true
Number 47644 found in BST: true
Number 5530 found in BST: true
Number 80979 found in BST: true
Number 80463 found in BST: true
Number 41428 found in BST: true
Number 21522 found in BST: true
Number 86903 found in BST: true
Number 11279 found in BST: true
Number 26214 found in BST: true
Number 37953 found in BST: true
Number 41776 found in BST: true
Number 91795 found in BST: true
Number 106017 found in BST: false
Number 80586 found in BST: true
Number 93940 found in BST: true
Number 77229 found in BST: true
Number 77281 found in BST: true
Number 109464 found in BST: false
Number 25612 found in BST: true
Number 104065 found in BST: false
Number 49634 found in BST: true
Number 54762 found in BST: true
Number 75622 found in BST: true
Number 27917 found in BST: true
Number 8481 found in BST: true
Number 13418 found in BST: true
Number 91573 found in BST: true
Number 26952 found in BST: true
Number 35161 found in BST: true
Number 33636 found in BST: true
Number 102762 found in BST: false
Number 87277 found in BST: true

Number 81229 found in BST: true
Number 58934 found in BST: true
Number 92358 found in BST: true
Number 93339 found in BST: true
Number 71724 found in BST: true
Number 26409 found in BST: true
Number 63949 found in BST: true
Number 82787 found in BST: true
Number 51241 found in BST: true
Number 86027 found in BST: true
Number 92887 found in BST: true
Number 98956 found in BST: true
Number 87958 found in BST: true
Number 52032 found in BST: true
Number 41398 found in BST: true
Number 13091 found in BST: true
Number 52222 found in BST: true
Number 85763 found in BST: true
Number 68752 found in BST: true
Number 29268 found in BST: true
Number 109995 found in BST: false
Number 101164 found in BST: false
Number 44021 found in BST: true
Number 102132 found in BST: false
Number 52343 found in BST: true
Number 12689 found in BST: true
Number 19617 found in BST: true
Number 2074 found in BST: true
Number 15328 found in BST: true
Number 34806 found in BST: true
Number 85186 found in BST: true
Number 37324 found in BST: true
Number 10584 found in BST: true
Number 85610 found in BST: true
Number 43925 found in BST: true
Number 24888 found in BST: true
Number 49972 found in BST: true
Number 89129 found in BST: true
Number 30676 found in BST: true
Number 38689 found in BST: true
Number 75745 found in BST: true
Number 72066 found in BST: true
Number 55158 found in BST: true
Number 41911 found in BST: true
Number 39289 found in BST: true
Number 68941 found in BST: true
Number 90032 found in BST: true
Number 28489 found in BST: true

Number 103675 found in BST: false
Number 61865 found in BST: true
Number 41123 found in BST: true
Number 108676 found in BST: false
Number 68425 found in BST: true
Number 34948 found in BST: true
Number 84561 found in BST: true
Number 34477 found in BST: true
Number 41539 found in BST: true
Number 104005 found in BST: false
Number 41046 found in BST: true
Number 25567 found in BST: true
Number 19285 found in BST: true
Number 28948 found in BST: true
Number 12866 found in BST: true
Number 79845 found in BST: true
Number 74203 found in BST: true
Number 107714 found in BST: false
Number 69249 found in BST: true
Number 87152 found in BST: true
Number 49047 found in BST: true
Number 2974 found in BST: true
Number 95548 found in BST: true
Number 99187 found in BST: true
Number 29839 found in BST: true
Number 28064 found in BST: true
Number 102995 found in BST: false
Number 31662 found in BST: true
Number 43856 found in BST: true
Number 65213 found in BST: true
Number 42623 found in BST: true
Number 8175 found in BST: true
Number 40965 found in BST: true
Number 45963 found in BST: true
Number 32302 found in BST: true
Number 98460 found in BST: true
Number 58589 found in BST: true
Number 109766 found in BST: false
Number 17417 found in BST: true
Number 84161 found in BST: true
Number 14823 found in BST: true
Number 19668 found in BST: true
Number 83008 found in BST: true
Number 92210 found in BST: true
Number 64847 found in BST: true
Number 65066 found in BST: true
Number 96280 found in BST: true
Number 9888 found in BST: true

Number 80279 found in BST: true
Number 57316 found in BST: true
Number 59954 found in BST: true
Number 26153 found in BST: true
Number 81329 found in BST: true
Number 73383 found in BST: true
Number 40028 found in BST: true
Number 33146 found in BST: true
Number 61170 found in BST: true
Number 11283 found in BST: true
Number 3764 found in BST: true
Number 76609 found in BST: true
Number 40399 found in BST: true
Number 17055 found in BST: true
Number 4740 found in BST: true
Number 27174 found in BST: true
Number 245 found in BST: true
Number 10552 found in BST: true
Number 14929 found in BST: true
Number 88205 found in BST: true
Number 60432 found in BST: true
Number 53640 found in BST: true
Number 2998 found in BST: true
Number 102590 found in BST: false
Number 25307 found in BST: true
Number 55886 found in BST: true
Number 47147 found in BST: true
Number 68739 found in BST: true
Number 96786 found in BST: true
Number 88975 found in BST: true
Number 23879 found in BST: true
Number 87539 found in BST: true
Number 8180 found in BST: true
Number 57633 found in BST: true
Number 58684 found in BST: true
Number 64621 found in BST: true
Number 93731 found in BST: true
Number 98773 found in BST: true
Number 14940 found in BST: true
Number 82887 found in BST: true
Number 32560 found in BST: true
Number 63474 found in BST: true
Number 10436 found in BST: true
Number 105163 found in BST: false
Number 30844 found in BST: true
Number 11576 found in BST: true
Number 32558 found in BST: true
Number 70021 found in BST: true

Number 102871 found in BST: false
Number 13023 found in BST: true
Number 56435 found in BST: true
Number 11274 found in BST: true
Number 72818 found in BST: true
Number 58914 found in BST: true
Number 68787 found in BST: true
Number 93940 found in BST: true
Number 108842 found in BST: false
Number 36640 found in BST: true
Number 78501 found in BST: true
Number 18362 found in BST: true
Number 97323 found in BST: true
Number 23326 found in BST: true
Number 52064 found in BST: true
Number 25939 found in BST: true
Number 98738 found in BST: true
Number 52528 found in BST: true
Number 98272 found in BST: true
Number 67061 found in BST: true
Number 40646 found in BST: true
Number 36382 found in BST: true
Number 69202 found in BST: true
Number 49792 found in BST: true
Number 60541 found in BST: true
Number 85062 found in BST: true
Number 7779 found in BST: true
Number 32228 found in BST: true
Number 12487 found in BST: true
Number 8868 found in BST: true
Number 76304 found in BST: true
Number 75406 found in BST: true
Number 53494 found in BST: true
Number 26378 found in BST: true
Number 108021 found in BST: false
Number 70784 found in BST: true
Number 107414 found in BST: false
Number 69842 found in BST: true
Number 33750 found in BST: true
Number 65152 found in BST: true
Number 57120 found in BST: true
Number 88232 found in BST: true
Number 2603 found in BST: true
Number 76998 found in BST: true
Number 20057 found in BST: true
Number 73400 found in BST: true
Number 22170 found in BST: true
Number 66621 found in BST: true

Number 38832 found in BST: true
Number 8017 found in BST: true
Number 60911 found in BST: true
Number 20336 found in BST: true
Number 108499 found in BST: false
Number 60455 found in BST: true
Number 97536 found in BST: true
Number 38842 found in BST: true
Number 100097 found in BST: false
Number 6811 found in BST: true
Number 2857 found in BST: true
Number 13504 found in BST: true
Number 98563 found in BST: true
Number 49468 found in BST: true
Number 89226 found in BST: true
Number 36143 found in BST: true
Number 70168 found in BST: true
Number 42715 found in BST: true
Number 62713 found in BST: true
Number 73010 found in BST: true
Number 48180 found in BST: true
Number 4677 found in BST: true
Number 6273 found in BST: true
Number 20498 found in BST: true
Number 45559 found in BST: true
Number 8897 found in BST: true
Number 64159 found in BST: true
Number 68893 found in BST: true
Number 58980 found in BST: true
Number 5350 found in BST: true
Number 66335 found in BST: true
Number 81764 found in BST: true
Number 34797 found in BST: true
Number 68726 found in BST: true
Number 63113 found in BST: true
Number 26776 found in BST: true
Number 55264 found in BST: true
Number 87141 found in BST: true
Number 66639 found in BST: true
Number 3264 found in BST: true
Number 95817 found in BST: true
Number 87762 found in BST: true
Number 97539 found in BST: true
Number 78962 found in BST: true
Number 66863 found in BST: true
Number 43416 found in BST: true
Number 62037 found in BST: true
Number 76500 found in BST: true

Number 5062 found in BST: true
Number 10424 found in BST: true
Number 64059 found in BST: true
Number 102998 found in BST: false
Number 70282 found in BST: true
Number 39408 found in BST: true
Number 55814 found in BST: true
Number 70898 found in BST: true
Number 80799 found in BST: true
Number 109772 found in BST: false
Number 91443 found in BST: true
Number 11764 found in BST: true
Number 27116 found in BST: true
Number 33973 found in BST: true
Number 98742 found in BST: true
Number 99839 found in BST: true
Number 18790 found in BST: true
Number 66736 found in BST: true
Number 105983 found in BST: false
Number 77712 found in BST: true
19.0
Number 23911 found in AVL Tree: true
Number 78554 found in AVL Tree: true
Number 58975 found in AVL Tree: true
Number 8123 found in AVL Tree: true
Number 46762 found in AVL Tree: true
Number 12599 found in AVL Tree: true
Number 60281 found in AVL Tree: true
Number 52104 found in AVL Tree: true
Number 16524 found in AVL Tree: true
Number 37916 found in AVL Tree: true
Number 3891 found in AVL Tree: true
Number 100631 found in AVL Tree: false
Number 36300 found in AVL Tree: true
Number 58104 found in AVL Tree: true
Number 98332 found in AVL Tree: true
Number 29258 found in AVL Tree: true
Number 96225 found in AVL Tree: true
Number 9559 found in AVL Tree: true
Number 72 found in AVL Tree: true
Number 99155 found in AVL Tree: true
Number 4853 found in AVL Tree: true
Number 38112 found in AVL Tree: true
Number 92492 found in AVL Tree: true
Number 24230 found in AVL Tree: true
Number 28260 found in AVL Tree: true
Number 100198 found in AVL Tree: false
Number 3596 found in AVL Tree: true

Number 92172 found in AVL Tree: true
Number 15004 found in AVL Tree: true
Number 6813 found in AVL Tree: true
Number 65021 found in AVL Tree: true
Number 64758 found in AVL Tree: true
Number 55338 found in AVL Tree: true
Number 3928 found in AVL Tree: true
Number 60975 found in AVL Tree: true
Number 5235 found in AVL Tree: true
Number 67231 found in AVL Tree: true
Number 73938 found in AVL Tree: true
Number 16857 found in AVL Tree: true
Number 20992 found in AVL Tree: true
Number 38602 found in AVL Tree: true
Number 43390 found in AVL Tree: true
Number 44686 found in AVL Tree: true
Number 25646 found in AVL Tree: true
Number 54330 found in AVL Tree: true
Number 106672 found in AVL Tree: false
Number 18981 found in AVL Tree: true
Number 4910 found in AVL Tree: true
Number 91159 found in AVL Tree: true
Number 105313 found in AVL Tree: false
Number 11598 found in AVL Tree: true
Number 40959 found in AVL Tree: true
Number 20025 found in AVL Tree: true
Number 22123 found in AVL Tree: true
Number 6125 found in AVL Tree: true
Number 35331 found in AVL Tree: true
Number 95915 found in AVL Tree: true
Number 15530 found in AVL Tree: true
Number 47978 found in AVL Tree: true
Number 68860 found in AVL Tree: true
Number 48056 found in AVL Tree: true
Number 37038 found in AVL Tree: true
Number 46947 found in AVL Tree: true
Number 2489 found in AVL Tree: true
Number 66219 found in AVL Tree: true
Number 61821 found in AVL Tree: true
Number 40267 found in AVL Tree: true
Number 88684 found in AVL Tree: true
Number 39805 found in AVL Tree: true
Number 43097 found in AVL Tree: true
Number 52418 found in AVL Tree: true
Number 11405 found in AVL Tree: true
Number 49004 found in AVL Tree: true
Number 41075 found in AVL Tree: true
Number 87250 found in AVL Tree: true

Number 62469 found in AVL Tree: true
Number 7366 found in AVL Tree: true
Number 44961 found in AVL Tree: true
Number 61751 found in AVL Tree: true
Number 101703 found in AVL Tree: false
Number 34763 found in AVL Tree: true
Number 56166 found in AVL Tree: true
Number 52185 found in AVL Tree: true
Number 40097 found in AVL Tree: true
Number 45381 found in AVL Tree: true
Number 29777 found in AVL Tree: true
Number 90819 found in AVL Tree: true
Number 17796 found in AVL Tree: true
Number 84758 found in AVL Tree: true
Number 98214 found in AVL Tree: true
Number 86551 found in AVL Tree: true
Number 29146 found in AVL Tree: true
Number 75106 found in AVL Tree: true
Number 79570 found in AVL Tree: true
Number 51410 found in AVL Tree: true
Number 65987 found in AVL Tree: true
Number 25751 found in AVL Tree: true
Number 40659 found in AVL Tree: true
Number 94463 found in AVL Tree: true
Number 97380 found in AVL Tree: true
Number 52395 found in AVL Tree: true
Number 48767 found in AVL Tree: true
Number 73499 found in AVL Tree: true
Number 109807 found in AVL Tree: false
Number 78692 found in AVL Tree: true
Number 9237 found in AVL Tree: true
Number 28082 found in AVL Tree: true
Number 15151 found in AVL Tree: true
Number 31878 found in AVL Tree: true
Number 61511 found in AVL Tree: true
Number 58341 found in AVL Tree: true
Number 4179 found in AVL Tree: true
Number 75637 found in AVL Tree: true
Number 38465 found in AVL Tree: true
Number 82890 found in AVL Tree: true
Number 13545 found in AVL Tree: true
Number 16296 found in AVL Tree: true
Number 88199 found in AVL Tree: true
Number 35828 found in AVL Tree: true
Number 37325 found in AVL Tree: true
Number 19966 found in AVL Tree: true
Number 89595 found in AVL Tree: true
Number 10066 found in AVL Tree: true

Number 98669 found in AVL Tree: true
Number 77545 found in AVL Tree: true
Number 35139 found in AVL Tree: true
Number 76418 found in AVL Tree: true
Number 26685 found in AVL Tree: true
Number 19972 found in AVL Tree: true
Number 17938 found in AVL Tree: true
Number 97951 found in AVL Tree: true
Number 40683 found in AVL Tree: true
Number 49388 found in AVL Tree: true
Number 57925 found in AVL Tree: true
Number 95070 found in AVL Tree: true
Number 12602 found in AVL Tree: true
Number 37637 found in AVL Tree: true
Number 13504 found in AVL Tree: true
Number 37996 found in AVL Tree: true
Number 64479 found in AVL Tree: true
Number 20252 found in AVL Tree: true
Number 53401 found in AVL Tree: true
Number 74948 found in AVL Tree: true
Number 105542 found in AVL Tree: false
Number 108294 found in AVL Tree: false
Number 17451 found in AVL Tree: true
Number 52127 found in AVL Tree: true
Number 47936 found in AVL Tree: true
Number 95558 found in AVL Tree: true
Number 98010 found in AVL Tree: true
Number 7530 found in AVL Tree: true
Number 35562 found in AVL Tree: true
Number 48505 found in AVL Tree: true
Number 74121 found in AVL Tree: true
Number 22521 found in AVL Tree: true
Number 87170 found in AVL Tree: true
Number 70289 found in AVL Tree: true
Number 12069 found in AVL Tree: true
Number 34707 found in AVL Tree: true
Number 46747 found in AVL Tree: true
Number 34814 found in AVL Tree: true
Number 37893 found in AVL Tree: true
Number 5445 found in AVL Tree: true
Number 60328 found in AVL Tree: true
Number 35209 found in AVL Tree: true
Number 15730 found in AVL Tree: true
Number 25400 found in AVL Tree: true
Number 50433 found in AVL Tree: true
Number 31119 found in AVL Tree: true
Number 8936 found in AVL Tree: true
Number 63182 found in AVL Tree: true

Number 45615 found in AVL Tree: true
Number 56930 found in AVL Tree: true
Number 37796 found in AVL Tree: true
Number 106591 found in AVL Tree: false
Number 16916 found in AVL Tree: true
Number 9466 found in AVL Tree: true
Number 64031 found in AVL Tree: true
Number 62636 found in AVL Tree: true
Number 65523 found in AVL Tree: true
Number 29668 found in AVL Tree: true
Number 20810 found in AVL Tree: true
Number 5649 found in AVL Tree: true
Number 37348 found in AVL Tree: true
Number 60785 found in AVL Tree: true
Number 33348 found in AVL Tree: true
Number 67978 found in AVL Tree: true
Number 11714 found in AVL Tree: true
Number 26803 found in AVL Tree: true
Number 101603 found in AVL Tree: false
Number 10718 found in AVL Tree: true
Number 10206 found in AVL Tree: true
Number 92668 found in AVL Tree: true
Number 77277 found in AVL Tree: true
Number 95213 found in AVL Tree: true
Number 44111 found in AVL Tree: true
Number 100396 found in AVL Tree: false
Number 102966 found in AVL Tree: false
Number 40226 found in AVL Tree: true
Number 84469 found in AVL Tree: true
Number 79629 found in AVL Tree: true
Number 21190 found in AVL Tree: true
Number 84801 found in AVL Tree: true
Number 60473 found in AVL Tree: true
Number 17492 found in AVL Tree: true
Number 64868 found in AVL Tree: true
Number 103819 found in AVL Tree: false
Number 16677 found in AVL Tree: true
Number 19647 found in AVL Tree: true
Number 51219 found in AVL Tree: true
Number 95248 found in AVL Tree: true
Number 44344 found in AVL Tree: true
Number 95155 found in AVL Tree: true
Number 28163 found in AVL Tree: true
Number 49498 found in AVL Tree: true
Number 87152 found in AVL Tree: true
Number 3309 found in AVL Tree: true
Number 34409 found in AVL Tree: true
Number 81526 found in AVL Tree: true

Number 178 found in AVL Tree: true
Number 53593 found in AVL Tree: true
Number 65000 found in AVL Tree: true
Number 32337 found in AVL Tree: true
Number 29456 found in AVL Tree: true
Number 92577 found in AVL Tree: true
Number 66136 found in AVL Tree: true
Number 56852 found in AVL Tree: true
Number 74476 found in AVL Tree: true
Number 7722 found in AVL Tree: true
Number 26384 found in AVL Tree: true
Number 2683 found in AVL Tree: true
Number 85437 found in AVL Tree: true
Number 109184 found in AVL Tree: false
Number 24793 found in AVL Tree: true
Number 70544 found in AVL Tree: true
Number 62291 found in AVL Tree: true
Number 102634 found in AVL Tree: false
Number 94436 found in AVL Tree: true
Number 55053 found in AVL Tree: true
Number 6826 found in AVL Tree: true
Number 49095 found in AVL Tree: true
Number 69921 found in AVL Tree: true
Number 38411 found in AVL Tree: true
Number 54480 found in AVL Tree: true
Number 50505 found in AVL Tree: true
Number 48983 found in AVL Tree: true
Number 16414 found in AVL Tree: true
Number 102013 found in AVL Tree: false
Number 82791 found in AVL Tree: true
Number 45939 found in AVL Tree: true
Number 71632 found in AVL Tree: true
Number 16739 found in AVL Tree: true
Number 52283 found in AVL Tree: true
Number 57857 found in AVL Tree: true
Number 1136 found in AVL Tree: true
Number 108521 found in AVL Tree: false
Number 61300 found in AVL Tree: true
Number 98705 found in AVL Tree: true
Number 91919 found in AVL Tree: true
Number 93742 found in AVL Tree: true
Number 104428 found in AVL Tree: false
Number 39850 found in AVL Tree: true
Number 43922 found in AVL Tree: true
Number 19622 found in AVL Tree: true
Number 63185 found in AVL Tree: true
Number 30951 found in AVL Tree: true
Number 3750 found in AVL Tree: true

Number 86382 found in AVL Tree: true
Number 55557 found in AVL Tree: true
Number 62515 found in AVL Tree: true
Number 22767 found in AVL Tree: true
Number 6121 found in AVL Tree: true
Number 56975 found in AVL Tree: true
Number 70993 found in AVL Tree: true
Number 48754 found in AVL Tree: true
Number 104733 found in AVL Tree: false
Number 72378 found in AVL Tree: true
Number 77490 found in AVL Tree: true
Number 16431 found in AVL Tree: true
Number 63490 found in AVL Tree: true
Number 89373 found in AVL Tree: true
Number 95223 found in AVL Tree: true
Number 86169 found in AVL Tree: true
Number 93356 found in AVL Tree: true
Number 83650 found in AVL Tree: true
Number 94974 found in AVL Tree: true
Number 95665 found in AVL Tree: true
Number 56085 found in AVL Tree: true
Number 86695 found in AVL Tree: true
Number 102974 found in AVL Tree: false
Number 56269 found in AVL Tree: true
Number 57061 found in AVL Tree: true
Number 63853 found in AVL Tree: true
Number 45687 found in AVL Tree: true
Number 39362 found in AVL Tree: true
Number 98185 found in AVL Tree: true
Number 77220 found in AVL Tree: true
Number 8780 found in AVL Tree: true
Number 8492 found in AVL Tree: true
Number 35693 found in AVL Tree: true
Number 31768 found in AVL Tree: true
Number 28283 found in AVL Tree: true
Number 12969 found in AVL Tree: true
Number 109302 found in AVL Tree: false
Number 50168 found in AVL Tree: true
Number 42614 found in AVL Tree: true
Number 10667 found in AVL Tree: true
Number 104672 found in AVL Tree: false
Number 3923 found in AVL Tree: true
Number 66597 found in AVL Tree: true
Number 80476 found in AVL Tree: true
Number 76085 found in AVL Tree: true
Number 97875 found in AVL Tree: true
Number 23232 found in AVL Tree: true
Number 62448 found in AVL Tree: true

Number 99825 found in AVL Tree: true
Number 41203 found in AVL Tree: true
Number 34699 found in AVL Tree: true
Number 86530 found in AVL Tree: true
Number 79883 found in AVL Tree: true
Number 36690 found in AVL Tree: true
Number 875 found in AVL Tree: true
Number 41827 found in AVL Tree: true
Number 26943 found in AVL Tree: true
Number 94109 found in AVL Tree: true
Number 107980 found in AVL Tree: false
Number 54161 found in AVL Tree: true
Number 38878 found in AVL Tree: true
Number 93417 found in AVL Tree: true
Number 80482 found in AVL Tree: true
Number 50421 found in AVL Tree: true
Number 68309 found in AVL Tree: true
Number 82080 found in AVL Tree: true
Number 13771 found in AVL Tree: true
Number 85486 found in AVL Tree: true
Number 11317 found in AVL Tree: true
Number 66694 found in AVL Tree: true
Number 7265 found in AVL Tree: true
Number 11507 found in AVL Tree: true
Number 76524 found in AVL Tree: true
Number 78468 found in AVL Tree: true
Number 85230 found in AVL Tree: true
Number 71105 found in AVL Tree: true
Number 104486 found in AVL Tree: false
Number 66780 found in AVL Tree: true
Number 56547 found in AVL Tree: true
Number 60328 found in AVL Tree: true
Number 68590 found in AVL Tree: true
Number 69780 found in AVL Tree: true
Number 90855 found in AVL Tree: true
Number 76996 found in AVL Tree: true
Number 88240 found in AVL Tree: true
Number 92692 found in AVL Tree: true
Number 81601 found in AVL Tree: true
Number 24594 found in AVL Tree: true
Number 51419 found in AVL Tree: true
Number 37128 found in AVL Tree: true
Number 73351 found in AVL Tree: true
Number 44395 found in AVL Tree: true
Number 91941 found in AVL Tree: true
Number 1007 found in AVL Tree: true
Number 76744 found in AVL Tree: true
Number 109938 found in AVL Tree: false

Number 15975 found in AVL Tree: true
Number 80408 found in AVL Tree: true
Number 64269 found in AVL Tree: true
Number 92242 found in AVL Tree: true
Number 76282 found in AVL Tree: true
Number 36265 found in AVL Tree: true
Number 109777 found in AVL Tree: false
Number 66461 found in AVL Tree: true
Number 85590 found in AVL Tree: true
Number 30344 found in AVL Tree: true
Number 12700 found in AVL Tree: true
Number 105066 found in AVL Tree: false
Number 108065 found in AVL Tree: false
Number 64625 found in AVL Tree: true
Number 49938 found in AVL Tree: true
Number 91222 found in AVL Tree: true
Number 31272 found in AVL Tree: true
Number 13796 found in AVL Tree: true
Number 8016 found in AVL Tree: true
Number 17569 found in AVL Tree: true
Number 96139 found in AVL Tree: true
Number 46463 found in AVL Tree: true
Number 10546 found in AVL Tree: true
Number 105288 found in AVL Tree: false
Number 60363 found in AVL Tree: true
Number 41350 found in AVL Tree: true
Number 54653 found in AVL Tree: true
Number 63544 found in AVL Tree: true
Number 7007 found in AVL Tree: true
Number 31378 found in AVL Tree: true
Number 12635 found in AVL Tree: true
Number 67614 found in AVL Tree: true
Number 35804 found in AVL Tree: true
Number 64048 found in AVL Tree: true
Number 18697 found in AVL Tree: true
Number 24416 found in AVL Tree: true
Number 11570 found in AVL Tree: true
Number 17822 found in AVL Tree: true
Number 94984 found in AVL Tree: true
Number 33442 found in AVL Tree: true
Number 34861 found in AVL Tree: true
Number 5161 found in AVL Tree: true
Number 21513 found in AVL Tree: true
Number 32690 found in AVL Tree: true
Number 14273 found in AVL Tree: true
Number 18773 found in AVL Tree: true
Number 91543 found in AVL Tree: true
Number 69188 found in AVL Tree: true

Number 77047 found in AVL Tree: true
Number 93735 found in AVL Tree: true
Number 92744 found in AVL Tree: true
Number 11014 found in AVL Tree: true
Number 18064 found in AVL Tree: true
Number 83253 found in AVL Tree: true
Number 22833 found in AVL Tree: true
Number 79564 found in AVL Tree: true
Number 62302 found in AVL Tree: true
Number 106162 found in AVL Tree: false
Number 45225 found in AVL Tree: true
Number 38579 found in AVL Tree: true
Number 27225 found in AVL Tree: true
Number 18635 found in AVL Tree: true
Number 63510 found in AVL Tree: true
Number 31013 found in AVL Tree: true
Number 35532 found in AVL Tree: true
Number 3111 found in AVL Tree: true
Number 74307 found in AVL Tree: true
Number 74444 found in AVL Tree: true
Number 9603 found in AVL Tree: true
Number 97861 found in AVL Tree: true
Number 29893 found in AVL Tree: true
Number 32576 found in AVL Tree: true
Number 9570 found in AVL Tree: true
Number 35740 found in AVL Tree: true
Number 94811 found in AVL Tree: true
Number 80553 found in AVL Tree: true
Number 100302 found in AVL Tree: false
Number 10794 found in AVL Tree: true
Number 104154 found in AVL Tree: false
Number 12006 found in AVL Tree: true
Number 51038 found in AVL Tree: true
Number 68076 found in AVL Tree: true
Number 28972 found in AVL Tree: true
Number 89774 found in AVL Tree: true
Number 88656 found in AVL Tree: true
Number 9805 found in AVL Tree: true
Number 52402 found in AVL Tree: true
Number 4878 found in AVL Tree: true
Number 11724 found in AVL Tree: true
Number 14334 found in AVL Tree: true
Number 104634 found in AVL Tree: false
Number 108746 found in AVL Tree: false
Number 32145 found in AVL Tree: true
Number 67638 found in AVL Tree: true
Number 37100 found in AVL Tree: true
Number 10112 found in AVL Tree: true

Number 48004 found in AVL Tree: true
Number 94173 found in AVL Tree: true
Number 86937 found in AVL Tree: true
Number 93698 found in AVL Tree: true
Number 51420 found in AVL Tree: true
Number 28766 found in AVL Tree: true
Number 91635 found in AVL Tree: true
Number 81148 found in AVL Tree: true
Number 95071 found in AVL Tree: true
Number 55798 found in AVL Tree: true
Number 80139 found in AVL Tree: true
Number 96285 found in AVL Tree: true
Number 46397 found in AVL Tree: true
Number 31284 found in AVL Tree: true
Number 12361 found in AVL Tree: true
Number 40573 found in AVL Tree: true
Number 50739 found in AVL Tree: true
Number 52196 found in AVL Tree: true
Number 84634 found in AVL Tree: true
Number 35829 found in AVL Tree: true
Number 91753 found in AVL Tree: true
Number 2990 found in AVL Tree: true
Number 6164 found in AVL Tree: true
Number 42382 found in AVL Tree: true
Number 64861 found in AVL Tree: true
Number 94465 found in AVL Tree: true
Number 92587 found in AVL Tree: true
Number 53230 found in AVL Tree: true
Number 46328 found in AVL Tree: true
Number 20724 found in AVL Tree: true
Number 109274 found in AVL Tree: false
Number 108498 found in AVL Tree: false
Number 80835 found in AVL Tree: true
Number 7312 found in AVL Tree: true
Number 84177 found in AVL Tree: true
Number 720 found in AVL Tree: true
Number 69179 found in AVL Tree: true
Number 5852 found in AVL Tree: true
Number 80245 found in AVL Tree: true
Number 48512 found in AVL Tree: true
Number 62806 found in AVL Tree: true
Number 66371 found in AVL Tree: true
Number 75518 found in AVL Tree: true
Number 23101 found in AVL Tree: true
Number 82193 found in AVL Tree: true
Number 509 found in AVL Tree: true
Number 1844 found in AVL Tree: true
Number 26988 found in AVL Tree: true

Number 56602 found in AVL Tree: true
Number 50127 found in AVL Tree: true
Number 16883 found in AVL Tree: true
Number 107855 found in AVL Tree: false
Number 83882 found in AVL Tree: true
Number 4481 found in AVL Tree: true
Number 57416 found in AVL Tree: true
Number 6185 found in AVL Tree: true
Number 68431 found in AVL Tree: true
Number 6585 found in AVL Tree: true
Number 23856 found in AVL Tree: true
Number 71707 found in AVL Tree: true
Number 7179 found in AVL Tree: true
Number 106946 found in AVL Tree: false
Number 5802 found in AVL Tree: true
Number 12935 found in AVL Tree: true
Number 62232 found in AVL Tree: true
Number 63681 found in AVL Tree: true
Number 27291 found in AVL Tree: true
Number 92140 found in AVL Tree: true
Number 37370 found in AVL Tree: true
Number 97475 found in AVL Tree: true
Number 21288 found in AVL Tree: true
Number 6237 found in AVL Tree: true
Number 16571 found in AVL Tree: true
Number 44518 found in AVL Tree: true
Number 41244 found in AVL Tree: true
Number 44318 found in AVL Tree: true
Number 39780 found in AVL Tree: true
Number 95975 found in AVL Tree: true
Number 35033 found in AVL Tree: true
Number 57531 found in AVL Tree: true
Number 81832 found in AVL Tree: true
Number 1631 found in AVL Tree: true
Number 94588 found in AVL Tree: true
Number 55100 found in AVL Tree: true
Number 1854 found in AVL Tree: true
Number 59033 found in AVL Tree: true
Number 27706 found in AVL Tree: true
Number 81354 found in AVL Tree: true
Number 57797 found in AVL Tree: true
Number 82186 found in AVL Tree: true
Number 63784 found in AVL Tree: true
Number 34436 found in AVL Tree: true
Number 64518 found in AVL Tree: true
Number 73530 found in AVL Tree: true
Number 20601 found in AVL Tree: true
Number 95338 found in AVL Tree: true

Number 58488 found in AVL Tree: true
Number 63952 found in AVL Tree: true
Number 82436 found in AVL Tree: true
Number 52919 found in AVL Tree: true
Number 8615 found in AVL Tree: true
Number 40862 found in AVL Tree: true
Number 104391 found in AVL Tree: false
Number 37835 found in AVL Tree: true
Number 52425 found in AVL Tree: true
Number 73712 found in AVL Tree: true
Number 874 found in AVL Tree: true
Number 105297 found in AVL Tree: false
Number 51332 found in AVL Tree: true
Number 23769 found in AVL Tree: true
Number 104704 found in AVL Tree: false
Number 10646 found in AVL Tree: true
Number 76306 found in AVL Tree: true
Number 37331 found in AVL Tree: true
Number 21112 found in AVL Tree: true
Number 32946 found in AVL Tree: true
Number 33242 found in AVL Tree: true
Number 98616 found in AVL Tree: true
Number 6691 found in AVL Tree: true
Number 98279 found in AVL Tree: true
Number 74583 found in AVL Tree: true
Number 17502 found in AVL Tree: true
Number 30845 found in AVL Tree: true
Number 29626 found in AVL Tree: true
Number 104078 found in AVL Tree: false
Number 79778 found in AVL Tree: true
Number 86530 found in AVL Tree: true
Number 7715 found in AVL Tree: true
Number 14864 found in AVL Tree: true
Number 109739 found in AVL Tree: false
Number 47168 found in AVL Tree: true
Number 77009 found in AVL Tree: true
Number 31929 found in AVL Tree: true
Number 62802 found in AVL Tree: true
Number 9011 found in AVL Tree: true
Number 7299 found in AVL Tree: true
Number 41943 found in AVL Tree: true
Number 85272 found in AVL Tree: true
Number 27486 found in AVL Tree: true
Number 22332 found in AVL Tree: true
Number 12400 found in AVL Tree: true
Number 6446 found in AVL Tree: true
Number 88651 found in AVL Tree: true
Number 34604 found in AVL Tree: true

Number 8351 found in AVL Tree: true
Number 26085 found in AVL Tree: true
Number 72886 found in AVL Tree: true
Number 85293 found in AVL Tree: true
Number 103943 found in AVL Tree: false
Number 95994 found in AVL Tree: true
Number 29016 found in AVL Tree: true
Number 25918 found in AVL Tree: true
Number 60225 found in AVL Tree: true
Number 13573 found in AVL Tree: true
Number 57516 found in AVL Tree: true
Number 18997 found in AVL Tree: true
Number 76716 found in AVL Tree: true
Number 12113 found in AVL Tree: true
Number 43005 found in AVL Tree: true
Number 31688 found in AVL Tree: true
Number 59412 found in AVL Tree: true
Number 40722 found in AVL Tree: true
Number 66724 found in AVL Tree: true
Number 105494 found in AVL Tree: false
Number 37561 found in AVL Tree: true
Number 42082 found in AVL Tree: true
Number 1281 found in AVL Tree: true
Number 72935 found in AVL Tree: true
Number 98695 found in AVL Tree: true
Number 51867 found in AVL Tree: true
Number 11842 found in AVL Tree: true
Number 14020 found in AVL Tree: true
Number 59162 found in AVL Tree: true
Number 39181 found in AVL Tree: true
Number 40997 found in AVL Tree: true
Number 69137 found in AVL Tree: true
Number 41438 found in AVL Tree: true
Number 87437 found in AVL Tree: true
Number 63378 found in AVL Tree: true
Number 2847 found in AVL Tree: true
Number 36329 found in AVL Tree: true
Number 89870 found in AVL Tree: true
Number 25691 found in AVL Tree: true
Number 64258 found in AVL Tree: true
Number 48319 found in AVL Tree: true
Number 58197 found in AVL Tree: true
Number 30091 found in AVL Tree: true
Number 15039 found in AVL Tree: true
Number 103135 found in AVL Tree: false
Number 43445 found in AVL Tree: true
Number 27299 found in AVL Tree: true
Number 96259 found in AVL Tree: true

Number 101984 found in AVL Tree: false
Number 41933 found in AVL Tree: true
Number 5652 found in AVL Tree: true
Number 90611 found in AVL Tree: true
Number 3765 found in AVL Tree: true
Number 38532 found in AVL Tree: true
Number 29651 found in AVL Tree: true
Number 21573 found in AVL Tree: true
Number 80077 found in AVL Tree: true
Number 74412 found in AVL Tree: true
Number 75864 found in AVL Tree: true
Number 65924 found in AVL Tree: true
Number 41321 found in AVL Tree: true
Number 52849 found in AVL Tree: true
Number 51432 found in AVL Tree: true
Number 2997 found in AVL Tree: true
Number 71364 found in AVL Tree: true
Number 7736 found in AVL Tree: true
Number 104361 found in AVL Tree: false
Number 68962 found in AVL Tree: true
Number 12544 found in AVL Tree: true
Number 92753 found in AVL Tree: true
Number 58643 found in AVL Tree: true
Number 91015 found in AVL Tree: true
Number 32279 found in AVL Tree: true
Number 53289 found in AVL Tree: true
Number 29189 found in AVL Tree: true
Number 22741 found in AVL Tree: true
Number 1289 found in AVL Tree: true
Number 8303 found in AVL Tree: true
Number 59153 found in AVL Tree: true
Number 1896 found in AVL Tree: true
Number 82078 found in AVL Tree: true
Number 83958 found in AVL Tree: true
Number 14379 found in AVL Tree: true
Number 46388 found in AVL Tree: true
Number 48210 found in AVL Tree: true
Number 29972 found in AVL Tree: true
Number 8776 found in AVL Tree: true
Number 59496 found in AVL Tree: true
Number 11675 found in AVL Tree: true
Number 95106 found in AVL Tree: true
Number 91656 found in AVL Tree: true
Number 85812 found in AVL Tree: true
Number 5429 found in AVL Tree: true
Number 59592 found in AVL Tree: true
Number 81356 found in AVL Tree: true
Number 6546 found in AVL Tree: true

Number 34315 found in AVL Tree: true
Number 13857 found in AVL Tree: true
Number 42021 found in AVL Tree: true
Number 23244 found in AVL Tree: true
Number 109897 found in AVL Tree: false
Number 3496 found in AVL Tree: true
Number 7697 found in AVL Tree: true
Number 85481 found in AVL Tree: true
Number 72024 found in AVL Tree: true
Number 47644 found in AVL Tree: true
Number 5530 found in AVL Tree: true
Number 80979 found in AVL Tree: true
Number 80463 found in AVL Tree: true
Number 41428 found in AVL Tree: true
Number 21522 found in AVL Tree: true
Number 86903 found in AVL Tree: true
Number 11279 found in AVL Tree: true
Number 26214 found in AVL Tree: true
Number 37953 found in AVL Tree: true
Number 41776 found in AVL Tree: true
Number 91795 found in AVL Tree: true
Number 106017 found in AVL Tree: false
Number 80586 found in AVL Tree: true
Number 93940 found in AVL Tree: true
Number 77229 found in AVL Tree: true
Number 77281 found in AVL Tree: true
Number 109464 found in AVL Tree: false
Number 25612 found in AVL Tree: true
Number 104065 found in AVL Tree: false
Number 49634 found in AVL Tree: true
Number 54762 found in AVL Tree: true
Number 75622 found in AVL Tree: true
Number 27917 found in AVL Tree: true
Number 8481 found in AVL Tree: true
Number 13418 found in AVL Tree: true
Number 91573 found in AVL Tree: true
Number 26952 found in AVL Tree: true
Number 35161 found in AVL Tree: true
Number 33636 found in AVL Tree: true
Number 102762 found in AVL Tree: false
Number 87277 found in AVL Tree: true
Number 81229 found in AVL Tree: true
Number 58934 found in AVL Tree: true
Number 92358 found in AVL Tree: true
Number 93339 found in AVL Tree: true
Number 71724 found in AVL Tree: true
Number 26409 found in AVL Tree: true
Number 63949 found in AVL Tree: true

Number 82787 found in AVL Tree: true
Number 51241 found in AVL Tree: true
Number 86027 found in AVL Tree: true
Number 92887 found in AVL Tree: true
Number 98956 found in AVL Tree: true
Number 87958 found in AVL Tree: true
Number 52032 found in AVL Tree: true
Number 41398 found in AVL Tree: true
Number 13091 found in AVL Tree: true
Number 52222 found in AVL Tree: true
Number 85763 found in AVL Tree: true
Number 68752 found in AVL Tree: true
Number 29268 found in AVL Tree: true
Number 109995 found in AVL Tree: false
Number 101164 found in AVL Tree: false
Number 44021 found in AVL Tree: true
Number 102132 found in AVL Tree: false
Number 52343 found in AVL Tree: true
Number 12689 found in AVL Tree: true
Number 19617 found in AVL Tree: true
Number 2074 found in AVL Tree: true
Number 15328 found in AVL Tree: true
Number 34806 found in AVL Tree: true
Number 85186 found in AVL Tree: true
Number 37324 found in AVL Tree: true
Number 10584 found in AVL Tree: true
Number 85610 found in AVL Tree: true
Number 43925 found in AVL Tree: true
Number 24888 found in AVL Tree: true
Number 49972 found in AVL Tree: true
Number 89129 found in AVL Tree: true
Number 30676 found in AVL Tree: true
Number 38689 found in AVL Tree: true
Number 75745 found in AVL Tree: true
Number 72066 found in AVL Tree: true
Number 55158 found in AVL Tree: true
Number 41911 found in AVL Tree: true
Number 39289 found in AVL Tree: true
Number 68941 found in AVL Tree: true
Number 90032 found in AVL Tree: true
Number 28489 found in AVL Tree: true
Number 103675 found in AVL Tree: false
Number 61865 found in AVL Tree: true
Number 41123 found in AVL Tree: true
Number 108676 found in AVL Tree: false
Number 68425 found in AVL Tree: true
Number 34948 found in AVL Tree: true
Number 84561 found in AVL Tree: true

Number 34477 found in AVL Tree: true
Number 41539 found in AVL Tree: true
Number 104005 found in AVL Tree: false
Number 41046 found in AVL Tree: true
Number 25567 found in AVL Tree: true
Number 19285 found in AVL Tree: true
Number 28948 found in AVL Tree: true
Number 12866 found in AVL Tree: true
Number 79845 found in AVL Tree: true
Number 74203 found in AVL Tree: true
Number 107714 found in AVL Tree: false
Number 69249 found in AVL Tree: true
Number 87152 found in AVL Tree: true
Number 49047 found in AVL Tree: true
Number 2974 found in AVL Tree: true
Number 95548 found in AVL Tree: true
Number 99187 found in AVL Tree: true
Number 29839 found in AVL Tree: true
Number 28064 found in AVL Tree: true
Number 102995 found in AVL Tree: false
Number 31662 found in AVL Tree: true
Number 43856 found in AVL Tree: true
Number 65213 found in AVL Tree: true
Number 42623 found in AVL Tree: true
Number 8175 found in AVL Tree: true
Number 40965 found in AVL Tree: true
Number 45963 found in AVL Tree: true
Number 32302 found in AVL Tree: true
Number 98460 found in AVL Tree: true
Number 58589 found in AVL Tree: true
Number 109766 found in AVL Tree: false
Number 17417 found in AVL Tree: true
Number 84161 found in AVL Tree: true
Number 14823 found in AVL Tree: true
Number 19668 found in AVL Tree: true
Number 83008 found in AVL Tree: true
Number 92210 found in AVL Tree: true
Number 64847 found in AVL Tree: true
Number 65066 found in AVL Tree: true
Number 96280 found in AVL Tree: true
Number 9888 found in AVL Tree: true
Number 80279 found in AVL Tree: true
Number 57316 found in AVL Tree: true
Number 59954 found in AVL Tree: true
Number 26153 found in AVL Tree: true
Number 81329 found in AVL Tree: true
Number 73383 found in AVL Tree: true
Number 40028 found in AVL Tree: true

Number 33146 found in AVL Tree: true
Number 61170 found in AVL Tree: true
Number 11283 found in AVL Tree: true
Number 3764 found in AVL Tree: true
Number 76609 found in AVL Tree: true
Number 40399 found in AVL Tree: true
Number 17055 found in AVL Tree: true
Number 4740 found in AVL Tree: true
Number 27174 found in AVL Tree: true
Number 245 found in AVL Tree: true
Number 10552 found in AVL Tree: true
Number 14929 found in AVL Tree: true
Number 88205 found in AVL Tree: true
Number 60432 found in AVL Tree: true
Number 53640 found in AVL Tree: true
Number 2998 found in AVL Tree: true
Number 102590 found in AVL Tree: false
Number 25307 found in AVL Tree: true
Number 55886 found in AVL Tree: true
Number 47147 found in AVL Tree: true
Number 68739 found in AVL Tree: true
Number 96786 found in AVL Tree: true
Number 88975 found in AVL Tree: true
Number 23879 found in AVL Tree: true
Number 87539 found in AVL Tree: true
Number 8180 found in AVL Tree: true
Number 57633 found in AVL Tree: true
Number 58684 found in AVL Tree: true
Number 64621 found in AVL Tree: true
Number 93731 found in AVL Tree: true
Number 98773 found in AVL Tree: true
Number 14940 found in AVL Tree: true
Number 82887 found in AVL Tree: true
Number 32560 found in AVL Tree: true
Number 63474 found in AVL Tree: true
Number 10436 found in AVL Tree: true
Number 105163 found in AVL Tree: false
Number 30844 found in AVL Tree: true
Number 11576 found in AVL Tree: true
Number 32558 found in AVL Tree: true
Number 70021 found in AVL Tree: true
Number 102871 found in AVL Tree: false
Number 13023 found in AVL Tree: true
Number 56435 found in AVL Tree: true
Number 11274 found in AVL Tree: true
Number 72818 found in AVL Tree: true
Number 58914 found in AVL Tree: true
Number 68787 found in AVL Tree: true

Number 93940 found in AVL Tree: true
Number 108842 found in AVL Tree: false
Number 36640 found in AVL Tree: true
Number 78501 found in AVL Tree: true
Number 18362 found in AVL Tree: true
Number 97323 found in AVL Tree: true
Number 23326 found in AVL Tree: true
Number 52064 found in AVL Tree: true
Number 25939 found in AVL Tree: true
Number 98738 found in AVL Tree: true
Number 52528 found in AVL Tree: true
Number 98272 found in AVL Tree: true
Number 67061 found in AVL Tree: true
Number 40646 found in AVL Tree: true
Number 36382 found in AVL Tree: true
Number 69202 found in AVL Tree: true
Number 49792 found in AVL Tree: true
Number 60541 found in AVL Tree: true
Number 85062 found in AVL Tree: true
Number 7779 found in AVL Tree: true
Number 32228 found in AVL Tree: true
Number 12487 found in AVL Tree: true
Number 8868 found in AVL Tree: true
Number 76304 found in AVL Tree: true
Number 75406 found in AVL Tree: true
Number 53494 found in AVL Tree: true
Number 26378 found in AVL Tree: true
Number 108021 found in AVL Tree: false
Number 70784 found in AVL Tree: true
Number 107414 found in AVL Tree: false
Number 69842 found in AVL Tree: true
Number 33750 found in AVL Tree: true
Number 65152 found in AVL Tree: true
Number 57120 found in AVL Tree: true
Number 88232 found in AVL Tree: true
Number 2603 found in AVL Tree: true
Number 76998 found in AVL Tree: true
Number 20057 found in AVL Tree: true
Number 73400 found in AVL Tree: true
Number 22170 found in AVL Tree: true
Number 66621 found in AVL Tree: true
Number 38832 found in AVL Tree: true
Number 8017 found in AVL Tree: true
Number 60911 found in AVL Tree: true
Number 20336 found in AVL Tree: true
Number 108499 found in AVL Tree: false
Number 60455 found in AVL Tree: true
Number 97536 found in AVL Tree: true

Number 38842 found in AVL Tree: true
Number 100097 found in AVL Tree: false
Number 6811 found in AVL Tree: true
Number 2857 found in AVL Tree: true
Number 13504 found in AVL Tree: true
Number 98563 found in AVL Tree: true
Number 49468 found in AVL Tree: true
Number 89226 found in AVL Tree: true
Number 36143 found in AVL Tree: true
Number 70168 found in AVL Tree: true
Number 42715 found in AVL Tree: true
Number 62713 found in AVL Tree: true
Number 73010 found in AVL Tree: true
Number 48180 found in AVL Tree: true
Number 4677 found in AVL Tree: true
Number 6273 found in AVL Tree: true
Number 20498 found in AVL Tree: true
Number 45559 found in AVL Tree: true
Number 8897 found in AVL Tree: true
Number 64159 found in AVL Tree: true
Number 68893 found in AVL Tree: true
Number 58980 found in AVL Tree: true
Number 5350 found in AVL Tree: true
Number 66335 found in AVL Tree: true
Number 81764 found in AVL Tree: true
Number 34797 found in AVL Tree: true
Number 68726 found in AVL Tree: true
Number 63113 found in AVL Tree: true
Number 26776 found in AVL Tree: true
Number 55264 found in AVL Tree: true
Number 87141 found in AVL Tree: true
Number 66639 found in AVL Tree: true
Number 3264 found in AVL Tree: true
Number 95817 found in AVL Tree: true
Number 87762 found in AVL Tree: true
Number 97539 found in AVL Tree: true
Number 78962 found in AVL Tree: true
Number 66863 found in AVL Tree: true
Number 43416 found in AVL Tree: true
Number 62037 found in AVL Tree: true
Number 76500 found in AVL Tree: true
Number 5062 found in AVL Tree: true
Number 10424 found in AVL Tree: true
Number 64059 found in AVL Tree: true
Number 102998 found in AVL Tree: false
Number 70282 found in AVL Tree: true
Number 39408 found in AVL Tree: true
Number 55814 found in AVL Tree: true

Number 70898 found in AVL Tree: true
Number 80799 found in AVL Tree: true
Number 109772 found in AVL Tree: false
Number 91443 found in AVL Tree: true
Number 11764 found in AVL Tree: true
Number 27116 found in AVL Tree: true
Number 33973 found in AVL Tree: true
Number 98742 found in AVL Tree: true
Number 99839 found in AVL Tree: true
Number 18790 found in AVL Tree: true
Number 66736 found in AVL Tree: true
Number 105983 found in AVL Tree: false
Number 77712 found in AVL Tree: true
1.097394819E9
Process finished with exit code 0