ÇANKAYA UNIVERSITY

SENG 201 Data and Game Structures

Lab Assignment 8

In this exercise you will practice on **Binary Search Trees** with the problem of word frequency counting.

PROBLEM

Given text file, you will count the unique words and print how many times a word appears in the file. You will use **Binary Search Tree** as the data structure to keep word frequencies.

TASKS

1. Create `BinarySearchTree.java` file and copy the given code as the starting template for your tree implementation.

```
public class BinarySearchTree {

  public Node root;

  private class Node {
    String word;
    int count;
    Node left, right;

    public Node(String value) {
      this.word = value;
      this.count = 1;
      this.left = this.right = null;
    }
  }
}
```

2. Create the `Main.java` class for your main method. Implement static "`readTextFile`" method which takes a text file name and returns the array of words in the file.

```
public static String[] readTextFile( String filename ) { … }
```

3. Implement "`insert`" method for your `BinarySearchTree` which takes a String and if the string exists on the tree, increment its count by 1. Otherwise insert e new Node on the tree for the String with count 1.

```
public void insert( String word ) { … }
```

4. Implement "`printFrequencies`" method for your `BinarySearchTree` which prints the words and frequencies for the words in **alphabetical order** as in the example below. You can't use sorting, you have to use tree traversal.

```
word1: 4
word2: 2
word3: 10
…
```

```
public void printFrequencies() { … }
```

5. Now in your main method, read one of the text files given, insert the words into a BinarySearchTree and print the words and frequencies in the alphabetical order using the methods you implemented.

TESTING

Test your implementation with all the given text files (input1.txt, input2.txt, input3.txt). The first file should produce the following result:

```
Ali: 161
Ceren: 400
Elif: 924
Kerem: 255
Murat: 638
Sema: 96
Tugay: 715
Ufuk: 38
Zerrin: 877
```

You should submit one zip file name as **"YourNameSurname_Lab8.zip"** and it should contain all the java files you created.