

Lab 1 Report

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Dictionary Class:

We have dictionary text file contains the words we insert to the avl tree created in dictionary class, as we read line by line and insert it to the tree.

To insert\delete new word in dictionary we check if word is not found in tree then we insert\delete it to\from the tree then we write the words in the tree to the dictionary file.

For look up batch we loop for every word in queries file and check if it is found in tree we print found and increase counter else we print we did not find it.

For deletions batch we loop for every word in deletion file and check if it is found in tree we delete it else we print error we did not find this word.

Node Class:

We define value in node, height value, balancing factor and left and right nodes with setters and getters.

AVL Tree:

After insertion and deletion we update height and balancing factor then we check for balancing factor if it is in the valid range $(-1,0,1)$ and if it is not invalid we do rotation according to balancing factors of nodes (LL, LR, RL, RR) and we update height and balancing factor after each rotation.

Test Cases:

```
lab 1 > src > Demo > main
Run: Demo x
C:\Users\LapStore\.jdk\openjdk-17.0.2\bin\java.exe ...
PRESS 1 TO LOAD DICTIONARY
PRESS 2 TO PRINT DICTIONARY SIZE
PRESS 3 TO ADD NEW WORD TO DICTIONARY
PRESS 4 TO SEARCH FOR A WORD
PRESS 5 TO REMOVE A WORD
PRESS 6 FOR BATCH LOOK-UP
PRESS 7 FOR BATCH DELETION
PRESS 8 TO EXIT
1
LOADING FINISHED
2
7
3 ahmed
Word inserted successfully
4 ali
YES
4 nan
YES
4 omar
NO
5 nan
Word deleted successfully
5 amran
Error! Word not found
6
```

Run | TODO | Problems | Profiler | Terminal | Build

All files are up-to-date (a minute ago)

```
Project Run: Demo x
3 ahmed
Word inserted successfully
4 ali
YES
4 man
YES
4 omar
NO
5 man
Word deleted successfully
5 omran
Error! Word not found
0
ball -> YES
idiot -> YES
cup -> NO
zebra -> YES
ahmed -> YES
Number of words found = 4
7
Error! man can't be deleted
Error! toy can't be deleted
woman deleted successfully
Error! ant can't be deleted
0
```

Run TODO Problems Profiler Terminal Build

All files are up-to-date (2 minutes ago)

queries - Note...	deletions - Notepad	dictionary - Notepad
ball idiot cup zebra ahmed	man toy woman ant	ahmed ali ball idiot tea zebra

1 Windows (CRLF) UTF-8 Ln 1, Col 1 100% Windows (CRLF) UTF-8 Ln 1, Col 1 100% Unix (LF) UTF-8