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PS11

Q1

[Assignment GitHub Link](https://github.com/sourav977/DSA-assignment)

**Description:**

1. class Dictlist(dict):

is created to Overwrite Dictlist() to store multiple values for same Key

1. class Node:

is Employee class which stores Employee attributes id, name and designation

1. **employees = [ ]** is used to retrieve and store each employee details from input file **PS11Q1.txt** and insert into BST by iterating over it.
2. method **insert()** : to insert Employee details into BST
3. method **inorder()**: to store inorder traversal result in inorderTraversal List
4. **inorderTraversal[ ]** List we will use to store inorder traversal result and also for searching employee by name and designation
5. promptsPS11Q1.txt file used to read elements and search employee by ID, name and designation and write the final result into **outputPS11Q1.txt** file
6. method **searchEmployeeByID():** used to search employee by ID in BST. **empByID = { }** Dictionary is used to store search employee by ID details
7. method **searchEmployeeByNameAndDesignation():** used to search both employee by name and designation. **empByName = Dictlist()** and **empByDesignation = Dictlist()** Dictionary used to store search employee by name and designation details respectively.
8. Output is written into **outputPS11Q1.txt** file
9. File promptsPS11Q1.txt contains the items to search

**Time Complexity:**

**For the python code that I have written**

1. For **Insert()** method:

For inserting element , we have to traverse all elements. Therefore, insertion in binary tree has worst case complexity of O(n), In average case, is O(log n)

1. For **inorder()** method:

we have to traverse all elements. Therefore, inorder traversal in binary tree has worst case complexity of O(n), In average case, is O(log n)

1. For **inorderTraversal[ ]** List

Append element to list will cause O(1)

1. For **searchEmployeeByNameAndDesignation() method:**

We have to traverse/search whole **inorderTraversal[ ]** List, if match found, store them into **empByName** and **empByDesignation** Dictionary. When storing elements to dictionary for both average case and worse case, it is O(N). when finding values for corresponding keys in the dictionary, it is O(1)