Batch: B2 Roll No.: 16010124107
Experiment / assignment / tutorial No. 8
Grade: AA / AB / BB / BC / CC / CD /DD
Signature of the Staff In-charge with date

Title: Implement a dictionary for some real world application. Use C/C++ or python.

Objective: To implement a dictionary for real world application using python.

Expected Outcome of Experiment:

CO	Outcome
3	Describe concepts of advanced data structures like set, map & dictionary.

Books/ Journals/ Websites referred:

1. *Fundamentals Of Data Structures In C* – Ellis Horowitz, Satraj Sahni, Susan Anderson-Fred
2. *An Introduction to data structures with applications* – Jean Paul Tremblay, Paul G. Sorenson
3. *Data Structures A Pseudo Approach with C* – Richard F. Gilberg & Behrouz A. Forouzan
4. https://www.geeksforgeeks.org/binary-tree-data-structure/
5. https://www.thecrazyprogrammer.com/2015/03/c-program-for-binary-search-tree-insertion.html

Abstract: *(Define dictionary as data structures,applications of dictionary)*

A dictionary is a data structure that holds information in a key-value pair format. This special arrangement makes searching, insertion, and deletion using key very fast.

Applications of Dictionary:

1. Word-meaning storage in language apps like Duolingo
2. Frequency counters in algorithms

3. Boolean seen vectors for checking if a value has been seen in algorithms
4. Storing records by ID

Program:

(Function/method name, describe its purpose and write code for the same, followed by its output)

- The update function in python is used to add elements to dictionary
- The print function simply prints values to the screen
- The del function is used to delete an element by key

```
dict={}

print("Menu: \n1. Add word-meaning\n2. Search meaning\n3. Delete word\n4. Print dictionary\n5. Exit\n")

while(True):

    choice = int(input("Enter choice\n"))

    if choice==1:

        name = input("Enter word\n")

        meaning = input("Enter meaning\n")

        dict.update({name:meaning})

    elif choice==2:

        search = input("Enter key to search\n")

        print(dict.get(search,"Not found\n"))

    elif choice==3:

        search = input("Enter key to search\n")

        del dict[search]

    elif choice==4:

        print(dict)

    elif choice==5:
```

```
        print("Exiting!\n")
        exit()
    else:
        print("Invalid choice.\n")
```

Output:

```
PS C:\Users\syeda\OneDrive\Desktop\perso
nal\dict.py"
Menu:
1. Add word-meaning
2. Search meaning
3. Delete word
4. Print dictionary
5. Exit

Enter choice
1
Enter word
apple
Enter meaning
a red fruit
Enter choice
2
Enter key to search
apple
a red fruit
Enter choice
4
{'apple': 'a red fruit'}
Enter choice
1
Enter word
banana
Enter meaning
a lovely yellow fruit without seeds
Enter choice
1
Enter word
orange
```

```
1
Enter word
banana
Enter meaning
a lovely yellow fruit without seeds
Enter choice
1
Enter word
orange
Enter meaning
an orange round fruit that looks like a ball but you have to eat it
Enter choice
4
{'apple': 'a red fruit', 'banana': 'a lovely yellow fruit without seeds', 'orange': 'an orang
e round fruit that looks like a ball but you have to eat it'}
Enter choice
5
Exiting!
```

Conclusion:-

A dictionary is a powerful tool that can help in inserting and deleting elements in O(1) time. It is also exceedingly useful in searching for values by its key also in O(1) time, contrary to arrays and vectors that allow fastest searching in log n, that too with the constraint of being sorted.

PostLab Questions:

1) List applications of set, map and dictionary data structures

A set is used to store unique values.

Applications:

- Store Aadhar information of citizens
- Count unique elements in an array

A map and dictionary are both used to store key-value relationships.

Applications:

- Frequency counter
- Name-meaning database
- Relationship defining database