**BMI 2123 DATA STRUCTURES**

**ASSIGNMENT 4/Solution paper**

I choose the **MAP** data structure for "a program to store a word dictionary".

1-Implement some library

        &lt;iostream&gt;
        &lt;map&gt;
        &lt;string&gt;

2-Define Dictionary class

        Define a "dictionary" map, key a string,value a string

        Functions of Dictionary:

            void insertWord(string word,string meaning);

            void searchWord(string word);

            void listDictionary();

            void searchInterval(string word1,string word2);

            void eraseWord(string word);

            void updateMeaning(string word,string newMeaning);

            void countWords();

3-Explanation of insertWord(string word,string meaning) :

We use mapName.insert({key,value}) context for insert a Word to our dictionary.

Insert is a the Map ADT .

4-Explanation of searchWord(string word):This function search a word in the dictionary using Find(),that is a the Map ADT.

If find this Word, print screen "……… found",

        else print screen "…….. not found".

5-Explanation of listDictionary(): This function to display all dictionary on the screen with alphabethic order.

If dictionary is not empty, go through the whole dictionary with iterator.Each word and meaning print screen like that:

apple : elma

        Else print screen "no words in the dictionary".

6-Explanation of searchInterval(string word1,string word2):This function to display from Word 1 to include Word 2 on the screen.

Go through the whole dictionary with iterator.

İterators first(key) is equal to word1, print screen this Word and meaning .

After that iterator plus 1, new Word 1 is equal to new iterators first(key),again iterator mines 1.

Until the iterator's key is equal to word 2 this print is go on. Last time, iterator's key equal to Word 2, print Word 2, and go out from the loop with break.

7-Explanation of eraseWord(string word):We use this function erase a word from the dictionary.

If Word is in the dictionary, we can erase with erase() function.

> Else print screen "there is no such word in the dictionary".

8-Explanation of updateMeaning(string Word,string newMeaning): We assign a new meaning to a Word.

9-Explanation of countWords(): We learn "how many words in the dictionary?" with size() function.

If dictionary is not empty use size() function and display how many words in the dictionary.

> Else print scree "Dictionary is empty".


Main Function:

 1- Dictionary newDictionary;

| newDictionary ||
| --- | --- |
| Word(key) | Meaning(value) |

2- newDictionary.insertWord("apple","elma");

| newDictionary ||
| --- | --- |
| Word(key) | Meaning(value) |
| apple | elma |

3-newDictionary.insertWord("orange","portakal");

| newDictionary ||
| --- | --- |
| Word(key) | Meaning(value) |
| apple | elma |
| orange | portakal |


4-  newDictionary.insertWord("banana","muz");

| newDictionary ||
| --- | --- |
| Word(key) | Meaning(value) |

| apple | elma |
|-------|------|
| Banana | muz |
| orange | portakal |

5-newDictionary.insertWord("strawberry","çilek");

| newDictionary | |
|---------------|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| orange | portakal |
| strawberry | çilek |

6-newDictionary.insertWord("universal","evrensel");

| newDictionary | |
|---------------|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| orange | portakal |
| strawberry | çilek |
| Universal | evrensel |

7-newDictionary.insertWord("watermelon","karpuz");

| newDictionary | |
|---------------|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| orange | portakal |
| strawberry | çilek |
| universal | evrensel |
| watermelon | karpuz |

8-newDictionary.insertWord("school","okul");

| newDictionary | |
|---------------|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| orange | portakal |
| school | okul |
| strawberry | çilek |
| universal | evrensel |
| watermelon | karpuz |

9- newDictionary.insertWord("flower","çiçek");

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| flower | çiçek |
| orange | portakal |
| school | okul |
| strawberry | çilek |
| universal | evrensel |
| watermelon | karpuz |

10-newDictionary.insertWord("computer","bilgisayar");

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| computer | bilgisayar |
| flower | çiçek |
| orange | portakal |
| school | okul |
| strawberry | çilek |
| universal | evrensel |
| watermelon | karpuz |

11-newDictionary.insertWord("torch","meşale");

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| computer | bilgisayar |
| flower | çiçek |
| orange | portakal |
| school | okul |
| strawberry | çilek |
| torch | meşale |
| universal | evrensel |
| watermelon | karpuz |

12-newDictionary.searchWord("flower");

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |

→ 1

| apple | elma | → 2 |
| banana | muz | → 3 |
| computer | bilgisayar | → 4 |
| flower | çiçek | → 5 ★ |
| orange | portakal | |
| school | okul | |
| strawberry | çilek | |
| torch | meşale | |
| universal | evrensel | |
| watermelon | karpuz | |

output

flower found

13-newDictionary.searchWord("pink");

| newDictionary | | |
|---|---|---|
| Word(key) | Meaning(value) | |
| apple | elma | → 1 |
| banana | muz | → 2 |
| computer | bilgisayar | → 3 |
| flower | çiçek | → 4 |
| orange | portakal | → 5 |
| school | okul | → 6 |
| strawberry | çilek | → 7 |
| torch | meşale | → 8 |
| universal | evrensel | → 9 |
| watermelon | karpuz | → 10 |

output

pink not found

14-newDictionary.listDictionary();

| newDictionary | | |
|---|---|---|
| Word(key) | Meaning(value) | |
| apple | elma | → 1 |
| banana | muz | → 2 |
| computer | bilgisayar | → 3 |
| flower | çiçek | → 4 |
| orange | portakal | → 5 |
| school | okul | → 6 |
| strawberry | çilek | → 7 |
| torch | meşale | → 8 |
| universal | evrensel | → 9 |
| watermelon | karpuz | → 10 |

output

apple : elma
banana : muz
computer : bilgisayar
flower : çiçek
orange : portakal
school : okul
strawberry : çilek
torch : meşale
universal : evrensel
watermelon : karpuz

15-newDictionary.eraseWord("bell");

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| computer | bilgisayar |
| flower | çiçek |
| orange | portakal |
| school | okul |
| strawberry | çilek |
| torch | meşale |
| universal | evrensel |
| watermelon | karpuz |

1
2
3
4
5
6
7
8
9
10

output

there is no such word in the dictionary

16-newDictionary.updateMeaning("orange","turuncu");

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| orange | portakal |

turuncu

17-newDictionary.listDictionary();

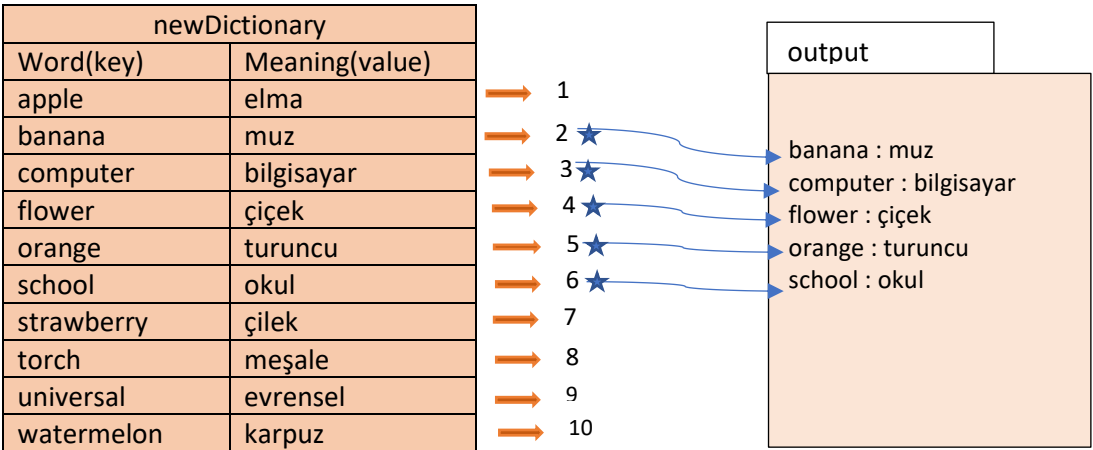| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| computer | bilgisayar |
| flower | çiçek |
| orange | turuncu |
| school | okul |
| strawberry | çilek |
| torch | meşale |
| universal | evrensel |
| watermelon | karpuz |

1
2
3
4
5
6
7
8
9
10

output

apple : elma
banana : muz
computer : bilgisayar
flower : çiçek
orange : turuncu
school : okul
strawberry : çilek
torch : meşale
universal : evrensel
watermelon : karpuz

18-newDictionary.countWords();

output

dictionary has 10 words

19-newDictionary.searchInterval("banana","school")

| newDictionary | |
|---|---|
| Word(key) | Meaning(value) |
| apple | elma |
| banana | muz |
| computer | bilgisayar |
| flower | çiçek |
| orange | turuncu |
| school | okul |
| strawberry | çilek |
| torch | meşale |
| universal | evrensel |
| watermelon | karpuz |

1
2 ★
3 ★
4 ★
5 ★
6 ★
7
8
9
10

**output**

banana : muz
computer : bilgisayar
flower : çiçek
orange : turuncu
school : okul

20-return 0;