

COMP8547 Advanced Computing Concepts – Fall 2023

Assignment 1

Variant 2 – Implementing a Dictionary using HashMap

Source Code with Explanation:

```
import java.util.*; // Import the necessary Java utilities, including the HashMap and Scanner classes.
```

```
public class Dictionary {  
    private static Map<String, String> dictionary = new HashMap<>(); // Create a HashMap to store word definitions.
```

```
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in); // Create a Scanner object to read user input.
```

```
        // Here we populate dictionary object with various definitions
```

```
        dictionary.put("apple", "a round fruit with red or green skin and sweet white flesh");
```

```
        dictionary.put("banana", "a long, curved fruit with a yellow skin and soft, sweet flesh"); //
```

These are the sample value and its definition

```
        dictionary.put("computer", "an electronic device for storing and processing data");
```

```
        dictionary.put("guava", "Guavas are plants in the genus Psidium of the family Myrtaceae.
```

There are about 100 species of tropical shrubs and small trees in the genus.");

```
        dictionary.put("honeyberry", "The honeyberry (also known as a blue honeysuckle, sweetberry honeysuckle, fly honeysuckle, blue fly honeysuckle, blue-berried honeysuckle or haskap) is a fruit that is edible");
```

```
        dictionary.put("loquat", "A loquat is a tropical fruit that grows on a tree. Since it is tropical, it will only grow in a warm, wet climate. It grows in Spain, Italy, Portugal, Turkey, India and Iran.");
```

```
        dictionary.put("sapote", "Sapote is a word for a soft, edible fruit. The word is part of the names of several plants from Mexico, Central America and northern parts of South America that have fruits.");
```

```
        dictionary.put("yuzu", "The yuzu is a citrus fruit and plant. It originated in East Asia. The fruit looks like a rough small and yellow grapefruit, and changes colour from green to yellow when it becomes more ripe.");
```

```
        dictionary.put("satsuma", "Satsuma is a variety of tangerine with a loose skin. It is named after the former Satsuma Province of Japan. In the United Kingdom it is often associated with Christmas");
```

```
        dictionary.put("redcurrant", "A redcurrant (Ribes rubrum) is a type of fruit. It is related to the blackcurrant. They are in the same genus Ribes.");
```

```
        System.out.println("Welcome to your Java GUI based Dictionary App developed by Bhuvaneshvar Narayan"); // Shows the welcome text
```

```

while (true) {
    System.out.println("\nMain-Menu:");
    System.out.println("1. Search or lookup for a word in Bhuvan's Dictionary");
    System.out.println("2. Don't remember the word? We got you covered! Get some
suggestions by typing the words partially");
    System.out.println("3. Interested in Contributing to Bhuvan's Dictionary? Feel free to Add
a new word!");
    System.out.println("4. We hate to see you go though, have a wonderful day! Bye!");
    System.out.print("What would you like to do? ");
    int bhuvan_s_options = scanner.nextInt(); // This is where the user input is taken
    scanner.nextLine(); // Consume a newline character here

    switch (bhuvan_s_options) {
        case 1:
            bhuvan_find_a_new_word(scanner); // This will call the function to find a new word
            break;
        case 2:
            bhuvan_helps(scanner); // This will call the function to get you the suggestions for
the partial words or phrases you enter
            break;
        case 3:
            contrbute_to_BD(scanner); // This will call the function to contribute new words to
Bhuvan's Dictionary
            break;
        case 4:
            System.out.println("Have a wonderful day!"); // This will close the scanner input
window and exits the Bhuvan's application
            scanner.close();
            System.exit(0);
        default:
            System.out.println("Ah! That doesn't count. Guess you will have to try typing that
again!"); // Default value
    }
}

private static void bhuvan_find_a_new_word(Scanner scanner) {
    System.out.print("Please enter a word: ");
    String word = scanner.nextLine().toLowerCase(); // This reads the word entered by the user
and converts it to lower case.

    if (dictionary.containsKey(word)) {

```

```
String definition = dictionary.get(word); // This will get the definition of the word from the user.
```

```
System.out.println("Here is the definition you asked: " + definition);  
} else {  
    System.out.println("Sorry, the word you are looking for is not found in Bhuvan's Dictionary. Perhaps, try adding this word in Bhuvan's Dictionary for future use.");  
}  
}
```

```
private static void bhuvan_helpers(Scanner scanner) {  
    System.out.print("Please enter a partial word or phrase you remember: ");  
    String partialWord = scanner.nextLine().toLowerCase(); // This will read the partial word entered by the user and convert it to lower case.
```

```
    List<String> suggestions = new ArrayList<>(); // This creates a list to store suggestions.
```

```
    // Iterate through the dictionary to find words that start with the partial word.
```

```
    for (String word : dictionary.keySet()) {  
        if (word.startsWith(partialWord)) {  
            suggestions.add(word); // Add matching words to the suggestions list  
        }  
    }  
}
```

```
    if (suggestions.isEmpty()) {  
        System.out.println("Sorry, no suggestions are found in Bhuvan's Dictionary!");  
    } else {  
        System.out.println("Here are your suggestions: " + String.join(", ", suggestions)); // This will print the suggestions  
    }  
}
```

```
private static void contribute_to_BD(Scanner scanner) {  
    System.out.print("Please enter the new word that you would like to contribute to Bhuvan's Dictionary: ");  
    String newWord = scanner.nextLine().toLowerCase(); // This will read the new word to be added and convert it to lower case
```

```
    if (dictionary.containsKey(newWord)) {  
        System.out.println("I'm afraid the word already exists in Bhuvan's dictionary.");  
    } else {  
        System.out.print("Please enter the word's definition: ");  
        String definition = scanner.nextLine(); // Read the definition of the new word.  
        dictionary.put(newWord, definition); // Add the new word and its definition to the dictionary  
    }  
}
```

```

        System.out.println("Thank you for your contribution. The word has been added to
Bhuvan's dictionary successfully.");
    }
}
}

```

Outputs:

```

<terminated> Dictionary [Java Application] /Applications/Eclipse.app/Contents/Eclipse/plugins/org.eclipse.justi.openjdk.hotspot.jre.full.macosx.aarch64_17.0.8.v20230831-1047/jre/bin/java (Oct. 7, 2023, 10:44:33 p.m. - 10:46:48 p.m.) [pid: 6642]
Welcome to your Java GUI based Dictionary App developed by Bhuvaneshvar Narayan

Main-Menu:
1. Search or lookup for a word in Bhuvan's Dictionary
2. Don't remember the word? We got you covered! Get some suggestions by typing the words partially
3. Interested in Contributing to Bhuvan's Dictionary? Feel free to Add a new word!
4. We hate to see you go though, have a wonderful day! Bye!
What would you like to do? 1
Please enter a word: loquat
Here is the definition you asked: A loquat is a tropical fruit that grows on a tree. Since it is tropical, it will only grow in a warm, wet climate. It grows in Spain, Italy, Port...

Main-Menu:
1. Search or lookup for a word in Bhuvan's Dictionary
2. Don't remember the word? We got you covered! Get some suggestions by typing the words partially
3. Interested in Contributing to Bhuvan's Dictionary? Feel free to Add a new word!
4. We hate to see you go though, have a wonderful day! Bye!
What would you like to do? 2
Please enter a partial word or phrase you remember: yu
Here are your suggestions: yuzu

Main-Menu:
1. Search or lookup for a word in Bhuvan's Dictionary
2. Don't remember the word? We got you covered! Get some suggestions by typing the words partially
3. Interested in Contributing to Bhuvan's Dictionary? Feel free to Add a new word!
4. We hate to see you go though, have a wonderful day! Bye!
What would you like to do? 3
Please enter the new word that you would like to contribute to Bhuvan's Dictionary: ribes
Please enter the word's definition: Ribes is a genus of about 150 species of flowering plants.
Thank you for your contribution. The word has been added to Bhuvan's dictionary successfully.

Main-Menu:
1. Search or lookup for a word in Bhuvan's Dictionary
2. Don't remember the word? We got you covered! Get some suggestions by typing the words partially
3. Interested in Contributing to Bhuvan's Dictionary? Feel free to Add a new word!
4. We hate to see you go though, have a wonderful day! Bye!
What would you like to do? 4
Have a wonderful day!

```

Explanation:

In this code, the output generates a GUI that gives the user various options:

- ☐ Look up new words.
- ☐ Suggest words based on partial input.
- ☐ Add new words to the Dictionary.
- ☐ Exit.

The user will input the numbers 1 through 4 and based on their input, it will generate the following options. If the user chooses a number that is not in the range, the app prompts them to enter the right numbers.

1. Depending on the user's choice, one of the following actions occurs:
 - **Choice 1:** "Search or lookup for a word in Bhuvan's Dictionary"
 - The app prompts the user to enter a word they want to look up.
 - If the word is found in the dictionary, it displays the word's definition.
 - If the word is not found, it informs the user that the word is not in the dictionary and suggests adding it.
 - **Choice 2:** "Don't remember the word? We got you covered! Get some suggestions by typing the words partially"

- The app prompts the user to enter a partial word or phrase they remember.
 - It then provides suggestions for words in the dictionary that start with the entered partial word or phrase.
 - **Choice 3:** "Interested in Contributing to Bhuvan's Dictionary? Feel free to Add a new word!"
 - The app prompts the user to enter a new word they want to contribute to the dictionary.
 - If the word already exists in the dictionary, it informs the user that the word is already present.
 - If the word is not in the dictionary, the program asks for the word's definition and adds it to the dictionary.
 - **Choice 4:** "We hate to see you go though, have a wonderful day! Bye!"
 - The program displays a goodbye message and exits.
2. After performing the selected action, the program returns to the main menu, allowing the user to choose another option or exit.
 3. The program continues to run until the user selects option 4 to exit, at which point it displays "Have a wonderful day!" and terminates.