Experiment 4

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Branch: BE/CSE
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Subject : Project Based Learning in JAVA with Lab

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1. **Aim:** Write a Program to perform the basic operations like insert, delete, display and search in list. List contains String object items where these operations are to be performed.

2. **Objective:** Develop a program to perform basic operations—insert, delete, display, and search—on a list containing string objects. The program should efficiently manage and manipulate the list based on user inputs.

3. **Implementation/Code:**

```
import java.util.ArrayList;
import java.util.InputMismatchException;
import java.util.NoSuchElementException;

import java.util.Scanner;

public class ListOperations {

public static void main(String[] args) {

ArrayList<String> list = new ArrayList<>();

Scanner scanner = new Scanner(System.in);

int choice;

 String item;

 while (true) {

    try {

        System.out.println("\n1. Insert");
```

```
System.out.println("2. Search");
System.out.println("3. Delete");
System.out.println("4. Display");
System.out.println("5. Exit");
System.out.print("Enter your choice: ");
if (!scanner.hasNextInt()) {
    System.out.println("Invalid input! Please enter a number between 1 and 5.");
    scanner.next();
    continue;
}
choice = scanner.nextInt();
scanner.nextLine();
switch (choice) {
    case 1:
        System.out.print("Enter the item to be inserted: ");
        item = scanner.nextLine();
        list.add(item);
        System.out.println("Inserted successfully.");
        break;
    case 2:
        System.out.print("Enter the item to search: ");
        item = scanner.nextLine();
        if (list.contains(item)) {
            System.out.println("Item found in the list.");
        } else {
            System.out.println("Item not found in the list.");
```

```
        }
        break;
    case 3:
        System.out.print("Enter the item to delete: ");
        item = scanner.nextLine();
        if (list.remove(item)) {
            System.out.println("Deleted successfully.");
        } else {
            System.out.println("Item does not exist.");
        }
        break;
    case 4:
        if (list.isEmpty()) {
            System.out.println("The list is empty.");
        } else {
            System.out.println("The items in the list are:");
            for (String listItem : list) {
                System.out.println(listItem);
            }       }
        break;
    case 5:
        System.out.println("Exiting the program.");
        scanner.close();
        return;
    default:
        System.out.println("Invalid choice. Please enter a number between 1 and 5.");
```

```
            }
        } catch (InputMismatchException e) {
            System.out.println("Invalid input! Please enter a valid number.");
            scanner.next();
        } catch (NoSuchElementException e) {
            System.out.println("Error: Unexpected input issue. Please restart the program.");
            break;
        } catch (Exception e) {
            System.out.println("An unexpected error occurred: " + e.getMessage());
          }
}
```

4. Output:

```
1. Insert
2. Search
3. Delete
4. Display
5. Exit
Enter your choice: 1
Enter the item to be inserted: chip
Inserted successfully.

1. Insert
2. Search
3. Delete
4. Display
5. Exit
Enter your choice: 1
Enter the item to be inserted: ball
Inserted successfully.

1. Insert
2. Search
3. Delete
4. Display
5. Exit
Enter your choice: 2
Enter the item to search: ball
Item found in the list.

1. Insert
2. Search
3. Delete
4. Display
5. Exit
Enter your choice: 3
Enter the item to delete: chip
Deleted successfully.
```

5. Learning Outcome:

- Understanding list operations such as insertion, deletion, searching, and displaying elements in Java.
- Applying OOP concepts like encapsulation and method abstraction to manage list operations efficiently.
- Handling user input using the Scanner class for interactive program execution.
- Utilizing control structures like loops and conditional statements to implement list operations dynamically.
- Enhancing problem-solving skills by organizing and manipulating string data in a structured manner.