Experiment 4

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Subject: Java Lab **Subject Code: 22CSH-359**

Aim: Write a Program to perform the basic operations like insert, delete, display and search in list. List contains String object items.

Objective:

This program performs basic operations on a list containing String objects. The operations include:

- Insertion of an element into the list.
- Deletion of an element from the list.
- Displaying the list contents.
- Searching for an element in the list.

Algorithm:

1. **Insert**: Add a string at the specified position using `list.add(index, "string")`.
2. **Delete**: Remove a string by index with `list.remove(index)` or by value using `list.remove("string")`.
3. **Display**: Loop through the list using `for` or `for-each` loop to print all elements.
4. **Search**: Use `list.contains("string")` to check if the string exists in the list.

Code:

1. Insert in list

```java
import java.util.*;

public class ListInsertion {
    public static void main(String args[]) {
        // Creating a List
        List<String> list = new ArrayList<String>();
        Scanner scanner = new Scanner(System.in);

        // Taking user input for list insertion
        System.out.print("Enter number of elements to insert: ");
        int n = scanner.nextInt();
        scanner.nextLine(); // Consume newline

        for (int i = 0; i < n; i++) {
            System.out.print("Enter element " + (i + 1) + ": ");
            String item = scanner.nextLine();
            list.add(item);
        }

        // Displaying the inserted elements
        System.out.println("Updated List: " + list);
        scanner.close();
    }
}
```

Output:

Input:

```
Enter number of elements to insert: 3
Enter element 1: Apple
Enter element 2: Banana
Enter element 3: Cherry
```

Output:

```
Updated List: [Apple, Banana, Cherry]
```

#2. Delete in list

```java
import java.util.*;

public class ListDeletion {
    public static void main(String args[]) {
        // Creating a List
        List<String> list = new ArrayList<String>();
        Scanner scanner = new Scanner(System.in);

        // Adding elements to the list
        list.add("Apple");
        list.add("Banana");
        list.add("Cherry");
        list.add("Date");

        // Displaying initial list
        System.out.println("Initial List: " + list);

        // Taking user input for deletion
        System.out.print("Enter element to delete: ");
        String item = scanner.nextLine();

        // Deleting element
        if (list.remove(item)) {
            System.out.println("Item deleted successfully.");
        } else {
            System.out.println("Item not found in the list.");
        }

        // Displaying updated list
        System.out.println("Updated List: " + list);
        scanner.close();
    }
}
```

OUTPUT:

```
Initial List: [Apple, Banana, Cherry, Date]
Enter element to delete: Banana
Item deleted successfully.
Updated List: [Apple, Cherry, Date]
```

If the user tries to delete an element that is not in the list:

```
Initial List: [Apple, Banana, Cherry, Date]
Enter element to delete: Mango
Item not found in the list.
Updated List: [Apple, Banana, Cherry, Date]
```

#3. Display and search in list

```java
import java.util.*;

public class ListDisplaySearch {
    public static void main(String args[]) {
        // Creating a List
        List<String> list = new ArrayList<String>();
        Scanner scanner = new Scanner(System.in);

        // Adding elements to the list
        list.add("Apple");
        list.add("Banana");
        list.add("Cherry");
        list.add("Date");

        // Displaying the list
        System.out.println("List Contents: " + list);

        // Taking user input for search
        System.out.print("Enter element to search: ");
        String item = scanner.nextLine();

        // Searching for the element
        if (list.contains(item)) {
            System.out.println("Item found in the list.");
        } else {
            System.out.println("Item not found in the list.");
        }

        scanner.close();
    }
}
```

OUTPUT:

```
List Contents: [Apple, Banana, Cherry, Date]
Enter element to search: Banana
Item found in the list.
```

If the user search for an element that is not in the list:

```
List Contents: [Apple, Banana, Cherry, Date]
Enter element to search: Mango
Item not found in the list.
```

#4 List contains String object items

```java
import java.util.*;

public class ListStringItems {
    public static void main(String args[]) {
        // Creating a List containing String objects
        List<String> list = new ArrayList<String>();

        // Adding elements to the list
        list.add("Apple");
        list.add("Banana");
        list.add("Cherry");
        list.add("Date");

        // Displaying the list
        System.out.println("List Contents: " + list);
    }
}
```

OUTPUT

```
List Contents: [Apple, Banana, Cherry, Date]
```

Learning Outcomes:

- **Understand how to perform basic operations (insert, delete, display, search) on a list.**
- **Learn to use ArrayList in Java for storing string objects.**
- **Master basic input/output handling using Scanner in Java.**
- **Learn how to use common list methods like add(), remove(), and contains().**
- **Understand control flow using loops and conditionals for interactive programs.**