Experiment 4

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1. Aim:

To implement a menu-driven program using a switch case that allows the user to perform the following operations on an ArrayList:

- Insertion – Add elements to the ArrayList based on user input.
- Deletion – Remove a specified element from the ArrayList.
- Search – Find an element in the ArrayList and display its index.
- Display – Show all elements of the ArrayList.

2. Objective:

- To enable dynamic insertion, deletion, searching, and displaying of elements based on user input.
- To enhance problem-solving skills by utilizing ArrayList functions effectively.

3. Implementation/Code:

```
import java.util.*;
public class Arraylist{
   static void insert(ArrayList<Integer> a,int idx,int val){
      if (idx<0||idx>a.size()) {
         System.out.println("Invalid index");
         return;
      }
      System.out.println("Value added successfully");
      a.add(idx,val);
   }
   static void delete(ArrayList<Integer> a,int val){
       if(a.isEmpty()) {
       System.out.println("ArrayList is empty");
       return;
       }
```

```
        int idx=a.indexOf(val);
        if(idx==-1) {
          System.out.println("No such value");
          return;
        }
        System.out.println("Value deleted successfully");
        a.remove(idx);
    }
    static void display(ArrayList<Integer> a){
       System.out.println("Data: "+ a);
    }
    static int Search(ArrayList<Integer> a,int val){
       if(a.isEmpty()) {
          System.out.println("ArrayList is empty");
          return -1;
       }
       int idx=a.indexOf(val);
       if(idx!=-1) return idx+1;
       System.out.println("Value not Found");
       return -1;
    }
    public static void main(String[] args) {
       ArrayList<Integer> list = new ArrayList<Integer>();
       Scanner sc=new Scanner(System.in);
       do{
          System.out.println("Enter 1-5 for :");
          System.out.println("1-Insert\n2-Delete\n3-Display\n4-Search\n5-Exit");
          int n=sc.nextInt();
       switch (n) {
          case 1:
              System.out.println("Enter index where you want to insert: ");
              int idx=sc.nextInt();
              System.out.println("Enter value you want to insert: ");
              int val=sc.nextInt();
              insert(list,idx,val);
             break;
          case 2:
             System.out.println("Enter value you want to delete: ");
             int d=sc.nextInt();
             delete(list, d);
```

```
                break;
            case 3:
                display(list);
                break;
            case 4:
            System.out.println("Enter val you want to search: ");
            int i=sc.nextInt();
            System.out.println("Your value is at position: "+Search(list, i));
                break;
            case 5:
             System.out.println("Goodbye...");
             sc.close();
             return;
            default:
                break;
        }
    } while(true);
  }
}
```

4. Output:

```
PS C:\Users\hp.pc\Desktop\programming languages\java> cd "c:\Users\hp.pc\Des
Arraylist.java } ; if ($?) { java Arraylist }
Enter 1-5 for :
1-Insert
2-Delete
3-Display
4-Search
5-Exit
1
Enter index where you want to insert:
0
Enter value you want to insert:
2
Value added successfully
Enter 1-5 for :
1-Insert
2-Delete
3-Display
4-Search
5-Exit
1
Enter index where you want to insert:
1
Enter value you want to insert:
3
Value added successfully
```

```
Enter 1-5 for :
1-Insert
2-Delete
3-Display
4-Search
5-Exit
3
Data: [2, 3]
Enter 1-5 for :
1-Insert
2-Delete
3-Display
4-Search
5-Exit
2
Enter value you want to delete:
3
Value deleted successfully
```

```
Enter val you want to search:
3
Value not Found
Your value is at position: -1
Enter 1-5 for :
1-Insert
2-Delete
3-Display
4-Search
5-Exit
4
Enter val you want to search:
2
Your value is at position: 1
Enter 1-5 for :
1-Insert
2-Delete
3-Display
4-Search
5-Exit
5
Goodbye...
PS C:\Users\hp.pc\Desktop\programming languages\java\javaClass>
```

5. Learning Outcomes

- Understand and apply the concept of ArrayList for dynamic storage management.
- Implement switch-case statements to manage user-driven operations efficiently.
- Develop skills in performing insertion, deletion, searching, and displaying elements dynamically.
- Gain hands-on experience in handling user input, exceptions, and edge cases in Java programming.