Experiment Number: 9 (Generics with List)

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Subject	OOP Lab

Aim: Use Arraylist to enter names of 6 Car companies. Use generics.

1. Search a name of a car company in List.
2. Sort the list
3. If car company name exceed 6 alphabets then remove from the list. Put "Maruti" in that place.
4. Remove duplicates if any.

Program:

```java
package oopExp9;
import java.util.*;
class CarArrayList
{
    // Taking input of Car CompanyNames
    public static ArrayList<String> take_input(int n)
    {
        Scanner ip = new Scanner(System.in);
        ArrayList<String> array_list = new ArrayList<String>(n);
        String car;
        System.out.println("Enter the names of the car companies : ");
        for (int i = 0; i<n; i++)
        {
            car = ip.nextLine();
            array_list.add(car);
        }
        return array_list;
    }
    // Removing duplicates if any
    public static ArrayList<String> remove_duplicates
(ArrayList<String> arr)
    {
        ArrayList<String> duplicate = new ArrayList<String>();
        System.out.print("ArrayList before : "+arr);
        for(int i=arr.size()-1;i>=0;i--)
        {
            if(!duplicate.contains(arr.get(i)))
                duplicate.add(arr.get(i));
```

```java
        }
        System.out.println("\nNew ArrayList is : "+duplicate);
        // arr=duplicate;
        return duplicate;
    }
    // Searching a name of a car company in List
    public static void search_company(ArrayList<String> arr)
    {
        Scanner ip = new Scanner(System.in);
        String name;
        System.out.print("Enter the name of the car company to be
searched : ");
        name= ip.nextLine();
        if(arr.contains(name))
            System.out.println("The car company "+name+" is present
in the ArrayList at index "+arr.indexOf(name));
        else
            System.out.println("ArrayList does not contain "+name);
    }
    // Sortng the list
    public static ArrayList<String> sort(ArrayList<String> arr)
    {
        Collections.sort(arr);
        System.out.println("Sorted Arraylist is : "+arr);
        return arr;
    }
    // If car company name exceed 6 alphabets then remove from the
list. Put "Maruti" in that place.
    public static ArrayList<String>
replace_long_name(ArrayList<String> arr)
    {
        System.out.println("ArrayList before : "+arr);
        System.out.println("Removing names with >6 alphabets &
replacing with Maruti :");
        for(int i=0;i<arr.size();i++)
        {
            if(arr.get(i).length()>6)
            {
                System.out.println("Replacing "+arr.get(i)+" at
index "+i+" with Maruti");
                arr.set(i,"Maruti");
            }
        }
        System.out.println("New ArrayList : "+arr);
        return arr;
    }
}
public class Exp9 {
    public static void main(String[] args)
```

```java
    {
        Scanner ip=new Scanner(System.in);
        System.out.println("\n*********************** Taking input
of car company names ***********************\n");
        System.out.print("Enter the number of elements in the
arraylist : ");
        int num=ip.nextInt();
        ArrayList<String> arr=CarArrayList.take_input(num);
        System.out.println("\nCar companies in List : "+arr);

System.out.println("\n****************************************************
***********************************\n");

        System.out.println("\n********************** Searching name
of given car company **********************\n");
        CarArrayList.search_company(arr);

System.out.println("\n****************************************************
***********************************\n");

        System.out.println("\n*******************************
Sorting ArrayList *******************************\n");
        arr=CarArrayList.sort(arr);

System.out.println("\n****************************************************
***********************************\n");

        System.out.println("\n******* Removing company names
exceeding 6 alphabets & Replacing with Maruti ******\n");
        arr=CarArrayList.replace_long_name(arr);

System.out.println("\n****************************************************
***********************************\n");

        System.out.println("\n*******************************
Removing Duplicates *******************************\n");
        arr=CarArrayList.remove_duplicates(arr);

System.out.println("\n****************************************************
***********************************\n");

        System.out.println("\n*******************************
Sorting ArrayList *******************************\n");
        arr=CarArrayList.sort(arr);

System.out.println("\n****************************************************
***********************************\n");
    }
}
```

Output:

Test Case 1 :

```
PS D:\PROJECT_AND_CODES>  d:; cd 'd:\PROJECT_AND_CODES'; & 'C:\Program Files\Java\jdk-
11.0.12\bin\java.exe' '-cp' 'D:\PROJECT_AND_CODES\Java' 'oopExp9.Exp9'

*********************** Taking input of car company names ***********************

Enter the number of elements in the arraylist : 6
Enter the names of the car companies :
Mercedes
Hyundai
BMW
Toyota
Volkswagen Group
Ford

Car companies in List : [Mercedes, Hyundai, BMW, Toyota, Volkswagen Group, Ford]

********************************************************************************



*********************** Searching name of given car company ***********************

Enter the name of the car company to be searched : Volkswagen Group
The car company Volkswagen Group is present in the ArrayList at index 4

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***************************** Sorting ArrayList *****************************

Sorted Arraylist is : [BMW, Ford, Hyundai, Mercedes, Toyota, Volkswagen Group]

********************************************************************************



******* Removing company names exceeding 6 alphabets & Replacing with Maruti ******

ArrayList before : [BMW, Ford, Hyundai, Mercedes, Toyota, Volkswagen Group]
Removing names with >6 alphabets & replacing with Maruti :
Replacing Hyundai at index 2 with Maruti
Replacing Mercedes at index 3 with Maruti
Replacing Volkswagen Group at index 5 with Maruti
New ArrayList : [BMW, Ford, Maruti, Maruti, Toyota, Maruti]

********************************************************************************



***************************** Removing Duplicates *****************************

ArrayList before : [BMW, Ford, Maruti, Maruti, Toyota, Maruti]
New ArrayList is : [Maruti, Toyota, Ford, BMW]

********************************************************************************



***************************** Sorting ArrayList *****************************

Sorted Arraylist is : [BMW, Ford, Maruti, Toyota]

********************************************************************************

PS D:\PROJECT_AND_CODES>
```

Test Case 2 :

```
PS D:\PROJECT_AND_CODES>  d:; cd 'd:\PROJECT_AND_CODES'; & 'C:\Program Files\Java\jdk-
11.0.12\bin\java.exe' '-cp' 'D:\PROJECT_AND_CODES\Java' 'oopExp9.Exp9'

*********************** Taking input of car company names ***********************

Enter the number of elements in the arraylist : 6
Enter the names of the car companies :
Mercedes
Hyundai
BMW
Toyota
Volkswagen Group
Maruti

Car companies in List : [Mercedes, Hyundai, BMW, Toyota, Volkswagen Group, Maruti]

********************************************************************************


*********************** Searching name of given car company ***********************

Enter the name of the car company to be searched : Ford
ArrayList does not contain Ford

********************************************************************************


***************************** Sorting ArrayList *****************************

Sorted Arraylist is : [BMW, Hyundai, Maruti, Mercedes, Toyota, Volkswagen Group]

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******* Removing company names exceeding 6 alphabets & Replacing with Maruti ******

ArrayList before : [BMW, Hyundai, Maruti, Mercedes, Toyota, Volkswagen Group]
Removing names with >6 alphabets & replacing with Maruti :
Replacing Hyundai at index 1 with Maruti
Replacing Mercedes at index 3 with Maruti
Replacing Volkswagen Group at index 5 with Maruti
New ArrayList : [BMW, Maruti, Maruti, Maruti, Toyota, Maruti]

********************************************************************************


***************************** Removing Duplicates *****************************

ArrayList before : [BMW, Maruti, Maruti, Maruti, Toyota, Maruti]
New ArrayList is : [Maruti, Toyota, BMW]

********************************************************************************


***************************** Sorting ArrayList *****************************

Sorted Arraylist is : [BMW, Maruti, Toyota]

********************************************************************************

PS D:\PROJECT_AND_CODES>
```