Experiment - 4

Student Name: Ayush Ranjan
UID: 23BCS10187
Branch: BE-CSE
Section/Group: KRG-2-B
Semester: 5th
Date of Performance: 16/9/25
Subject Name: PBLJ
Subject Code: 23CSH-304

1. **Aim:** Create a program to collect and store all the cards to assist the users in finding all the cards in a given symbol using Collection interface.

2. **Objective:** To understand collection interfaces like Map, List, and how to store and retrieve grouped data.

3. **Procedure:**
   a) Define a Card class with attributes like symbol, number.
   b) Use a HashMap<String, ArrayList<Card>> where the key is the symbol.
   c) Populate the map by grouping cards with the same symbol.
   d) Allow users to input a symbol to retrieve all matching cards.

4. **Code -**

```
import java.util.*;

public class CardCollection {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);

      Map<String, List<String>> cardMap = new HashMap<>();

      System.out.print("Enter the number of cards: ");
      int n = sc.nextInt();
      sc.nextLine(); // consume newline

      for (int i = 0; i < n; i++) {
         System.out.println("\nEnter details for card " + (i + 1) + ":");
         System.out.print("Enter Symbol (e.g., Hearts, Spades): ");
         String symbol = sc.nextLine();
         System.out.print("Enter Card Value (e.g., A, 2, King): ");
         String value = sc.nextLine();

         cardMap.putIfAbsent(symbol, new ArrayList<>());
         cardMap.get(symbol).add(value);
      }
```

```
        System.out.println("\nAll cards grouped by symbol:");
        for (String symbol : cardMap.keySet()) {
            System.out.println(symbol + " -> " + cardMap.get(symbol));
        }


        System.out.print("\nEnter a symbol to find its cards: ");
        String searchSymbol = sc.nextLine();

        if (cardMap.containsKey(searchSymbol)) {
            System.out.println("Cards in " + searchSymbol + ": " + cardMap.get(searchSymbol));
        } else {
            System.out.println("No cards found for symbol: " + searchSymbol);
        }

        sc.close();
    }
}
```

5. Output -

```
Enter the number of cards: 4

Enter details for card 1:
Enter Symbol (e.g., Hearts, Spades): Hearts
Enter Card Value (e.g., A, 2, King): A

Enter details for card 2:
Enter Symbol (e.g., Hearts, Spades): Spades
Enter Card Value (e.g., A, 2, King): King

Enter details for card 3:
Enter Symbol (e.g., Hearts, Spades): Hearts
Enter Card Value (e.g., A, 2, King): 10

Enter details for card 4:
Enter Symbol (e.g., Hearts, Spades): Clubs
Enter Card Value (e.g., A, 2, King): 5

All cards grouped by symbol:
Hearts -> [A, 10]
Spades -> [King]
Clubs -> [5]

Enter a symbol to find its cards: Hearts
Cards in Hearts: [A, 10]
```

6. Learning Outcomes:

a) Gained understanding of how to use **Map** and **List** from the Collection Framework.
b) Learnt to store and retrieve **grouped data** effectively.
c) Gained experience in **user input handling** and **data organization**.
d) Learnt to use **putIfAbsent()** and **get()** methods for managing Map entries.
e) Understood how to iterate through a **Map** using `keySet()` and retrieve values.