Experiment 5

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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:

The objective of this program is to **collect, store, and manage playing cards** using the **Collection interface in Java**. This program will assist users in:

1. **Adding cards** to a collection.
2. **Displaying all stored cards** in the collection.
3. **Finding all cards of a given symbol (suit)** efficiently.
4. **Providing a user-friendly interface** to interact with the card collection.

3. Implementation/Code:

```
import java.util.*;

public class Main {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      Map<String, List<Integer>> cardMap = new HashMap<>();
      System.out.println("Enter the number of cards: ");
      int totalCards = input.nextInt();

      for (int i = 1; i <= totalCards; i++) {
         System.out.println("Enter card " + i + " (symbol and value): ");
         String symbol = input.next();
         int value = input.nextInt();
         List<Integer> values = cardMap.getOrDefault(symbol, new ArrayList<>());
         values.add(value);
         cardMap.put(symbol, values);
      }
      System.out.println("Distinct symbols are:");
      for (String symbol : cardMap.keySet()) {
         System.out.print(symbol + " ");
      }
      System.out.println();
      for (String symbol : cardMap.keySet()) {
         List<Integer> values = cardMap.get(symbol);
```

```
            int sum = 0;
            System.out.println("Cards in " + symbol + " symbol:");
            for (int value : values) {
                System.out.println(symbol + " " + value);
                sum += value;
            }
            System.out.println("Number of cards: " + values.size());
            System.out.println("Sum of values: " + sum);
        }

        input.close();
    }
}
```

4. **Output**

```
Enter the number of cards:
5
Enter card 1 (symbol and value):
HEARTS 10
Enter card 2 (symbol and value):
SPADES 5
Enter card 3 (symbol and value):
HEARTS 3
Enter card 4 (symbol and value):
DIAMONDS 7
Enter card 5 (symbol and value):
SPADES 9
```

```
Distinct symbols are:
HEARTS SPADES DIAMONDS
Cards in HEARTS symbol:
HEARTS 10
HEARTS 3
Number of cards: 2
Sum of values: 13
Cards in SPADES symbol:
SPADES 5
SPADES 9
Number of cards: 2
Sum of values: 14
Cards in DIAMONDS symbol:
DIAMONDS 7
Number of cards: 1
Sum of values: 7
```

5. Learning Outcomes:

- **Understand the Collection Framework** – Gain practical experience in using Java's **Collection interface** and its implementations like **ArrayList, HashSet, and HashMap** for efficient data storage and retrieval.

- **Learn Object-Oriented Programming (OOP) Principles** – Apply **classes and objects** to represent playing cards, improving understanding of encapsulation and data abstraction.

- **Improve Data Management Skills** – Learn how to **store, organize, and retrieve data** efficiently using Java collections.

- **Enhance Problem-Solving Skills** – Develop the ability to design **optimized solutions** for organizing and searching data within a collection.

- **Implement Searching Mechanisms** – Understand how to filter and **retrieve specific elements** (cards of a given suit) from a collection using iteration and conditional logic.