Experiment 5

Student Name: Piyush Sharma **UID: 22BCS13018**
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1. **Aim:** Write a program to collect and store all the cards to assist the users in finding all the cards in a given symbol.
   This cards game consists of N number of cards. Get N number of cards details from the user and store the values in Card object with the attributes symbol and number.
   Store all the cards in a map with symbol as its key and list of cards as its value. Map is used here to easily group all the cards based on their symbol. Once all the details are captured print all the distinct symbols in alphabetical order from the Map. For each symbol print all the card details, number of cards and their sum respectively.

2. **Objective:** To develop a Java program that collects, stores, and groups playing cards based on their symbols using a map, allowing users to retrieve and analyze card details efficiently.

3. **Implementation/Code:**

```
import java.util.*;

class Card {
    private String symbol;
    private int number;

    public Card(String symbol, int number) {
        this.symbol = symbol;
        this.number = number;
    }

    public String getSymbol() {
        return symbol;
```

```
    }

    public int getNumber() {
        return number;
    }

    @Override
    public String toString() {
        return "Card{symbol='" + symbol + '',
    number=" + number + "}";
    }
}

public class CardGame {
    public static void main(String[] args) {
        Scanner scanner = new
    Scanner(System.in);
        Map<String, List<Card>> cardMap =
    new TreeMap<>();

        System.out.print("Enter number of
    cards: ");
        int n = scanner.nextInt();
        scanner.nextLine();

        for (int i = 0; i < n; i++) {
            System.out.println("Enter card " + (i
    + 1) + " details:");
            System.out.print("Symbol: ");
            String symbol = scanner.nextLine();
            System.out.print("Number: ");
            int number = scanner.nextInt();
            scanner.nextLine();

            cardMap.putIfAbsent(symbol, new
    ArrayList<>());
```

```
                cardMap.get(symbol).add(new
            Card(symbol, number));
            }

            System.out.println("\nDistinct Symbols
            in Alphabetical Order:");
            for (String symbol : cardMap.keySet())
            {
                List<Card> cards =
            cardMap.get(symbol);
                int sum =
            cards.stream().mapToInt(Card::getNumbe
            r).sum();
                System.out.println("Symbol: " +
            symbol);
                System.out.println("Cards: " + cards);
                System.out.println("Number of Cards:
            " + cards.size());
                System.out.println("Sum of Numbers:
            " + sum);
                System.out.println();
            }
            scanner.close();
        }
        }
    }
}
```

4. Output

```
iment4 }
Enter Number of Cards :
5
Enter card 1:
s
2
Enter card 2:
h
5
Enter card 3:
d
1
Enter card 4:
c
6
Enter card 5:
s
8
Distinct Symbols are :
c d h s
Cards in c Symbol
c 6
Number of cards : 1
Sum of Numbers : 6
Cards in d Symbol
d 1
Number of cards : 1
Sum of Numbers : 1
Cards in h Symbol
h 5
Number of cards : 1
Sum of Numbers : 5
Cards in s Symbol
s 2
s 8
Number of cards : 2
Sum of Numbers : 10
```

5. Learning Outcome

1. Understand how to use Java classes and objects to store and manage data effectively.
2. Learn how to use Map (TreeMap) to group and retrieve data efficiently based on a key.
3. Gain experience in handling user input dynamically and storing structured data in lists.
4. Enhance problem-solving skills by sorting and processing grouped data for meaningful insights.
5. Develop skills in iterating through collections and performing calculations such as count and sum on grouped data.