DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

Experiment 4

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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 consist 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 symbols 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.

2. **Objective :** This program collects and stores N cards, grouping them by symbol in a map for easy retrieval. It displays distinct symbols in alphabetical order along with their associated cards, total count, and sum of numbers, ensuring efficient organization and user-friendly output.

3. **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;
```

```
    }

    public String toString() {
        return symbol + " " + number;
    }
}

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

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

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

            System.out.print("Enter number: ");
            int number = sc.nextInt();
            sc.nextLine();

            Card card = new Card(symbol, number);

            cardMap.computeIfAbsent(symbol, k -> new
ArrayList<>()).add(card);
        }

        List<String> symbols = new ArrayList<>(cardMap.keySet());
        Collections.sort(symbols);

        System.out.println("\nDistinct symbols in alphabetical order:");
        for (String s : symbols) {
            System.out.println(s);
        }

        // Optional: Show cards grouped by symbol
        System.out.println("\nCards grouped by symbol:");
```

```
        for (String s : symbols) {
            System.out.println("Symbol: " + s);
            for (Card c : cardMap.get(s)) {
                System.out.println("  Number: " + c.getNumber());
            }
        }

        sc.close();
    }
}
```

4. Output:

```
Enter number of cards: 2
Enter card 1 details:
Enter symbol: ace
Enter number: 1
Enter card 2 details:
Enter symbol: king
Enter number: 2

Distinct symbols in alphabetical order:
ace
king

Cards grouped by symbol:
Symbol: ace
  Number: 1
Symbol: king
  Number: 2
```

5. Learning Outcomes

- Understand how to use maps (dictionaries) for efficient data storage and retrieval.
- Learn to group and organize data based on a key attribute.
- Gain experience in handling user input and storing objects dynamically.
- Develop skills in sorting and displaying structured data in a meaningful.