Experiment No: 2.2

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Subject Name: Project Based Learning in Java with Lab
Subject Code: 21CSH-319

Aim: Create a program to collect unique symbols from a set of cards using set interface.

Objective:

1. To learn about Classes.
2. To learn about hashset in java.

Input/Apparatus Used: IntelliJ / VS Code.

Procedure/Algorithm/Pseudocode

1. Define the Card class:

Create a class named Card.
Add private attributes: symbol (char) and value (int).
Provide a constructor that initializes the symbol and value attributes.
Implement getter and setter methods for the symbol and value attributes.

2. Define the StartGame class:

Declare instance variables: list, cards, map.

3. Define the playGame() method:

Accept user input for the number of turns.
Inside a loop, prompt the user to choose a card symbol and value for each turn:
Accept input for the symbol and value.
Check if the value is within the valid range (1-13) for the chosen symbol.

If valid, call the createCard method to create a new Card object and add it to the list.
Decrement the number of turns.

4. Define the createCard() method:

Accept parameters for symbol and value.
Create a new Card object with the given symbol and value.
Add the new Card object to the list.

5. Define the process() method:

Iterate through the list of cards.
Update the map to keep track of symbols and their occurrence.
Iterate through the map entries:
Add the first occurrence of each symbol to the cards set.

6. Define the display() method:

Invoke the process method to populate the cards set.
Print the number of cards collected and display each card in the set.

7. The main() method:

Create a Scanner object for user input.
Create an instance of the StartGame class.
Call the playGame method to start the game.
Call the display method to show the collected cards.
Close the Scanner object.

Code:

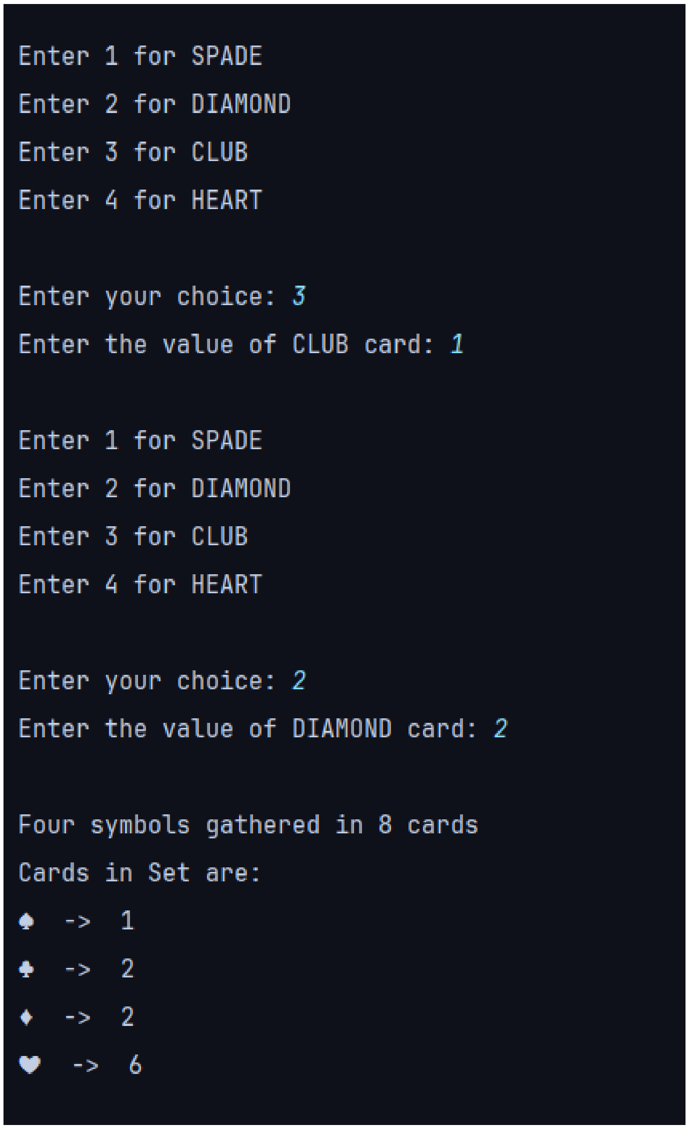
```
package University.Java_Using_Project.Experiment5;

import java.util.*;

class Card {
    private char symbol;
    private int value;

    public Card(char symbol, int value) {
        this.symbol = symbol;
        this.value = value;
    }

    public char getSymbol() {
        return symbol;
    }

    public void setSymbol(char symbol) {
        this.symbol = symbol;
    }

    public int getValue() {
        return value;
    }

    public void setValue(int value) {
        this.value = value;
    }

    @Override
    public String toString() {
        return symbol + " " + value;
    }
}
```

```
class SortBySymbol implements Comparator<Card> {
    @Override
    public int compare(Card o1, Card o2) {
        return Character.compare(o1.getSymbol(), o2.getSymbol());
    }
}

class StartGame {
    ArrayList<Card> list = new ArrayList<>();
    Set<Card> cards = new TreeSet<>(new SortBySymbol());
    Map<Character, Boolean> map = new LinkedHashMap<>();

    void process(List<Card> list) {
        for (Card c : list) {
            map.put(c.getSymbol(), true);
        }

        for (Map.Entry<Character, Boolean> m : map.entrySet()) {
            for (Card c : list) {
                if (m.getKey() == c.getSymbol() && m.getValue()) {
                    cards.add(c);
                    map.put(c.getSymbol(), false);
                }
            }
        }
    }

    void display() {
        process(list);
        System.out.println("\nFour symbols gathered in " + list.size() + " cards");
        System.out.println("Cards in Set are:");
        for (Card c : cards) {
            System.out.println(c.getSymbol() + "  ->  " + c.getValue());
        }
    }

    void createCard(char symbol, int value) {
        list.add(new Card(symbol, value));
    }
```

```
void playGame(Scanner in) {
    System.out.println("Enter the number of turns");
    int turns = in.nextInt();
    while (turns > 0) {
        System.out.println("\nEnter 1 for SPADE");
        System.out.println("Enter 2 for DIAMOND");
        System.out.println("Enter 3 for CLUB");
        System.out.println("Enter 4 for HEART\n");
        System.out.print("Enter your choice: ");
        int choice = in.nextInt();
        switch (choice) {
            case 1: {
                char symbol = '♠';
                System.out.print("Enter the value of SPADE card: ");
                int value = in.nextInt();
                if (1 <= value && value <= 13) {
                    createCard(symbol, value);
                    turns--;
                } else {
                    System.out.println("Value is invalid!!!");
                }
            }
            break;
            case 2: {
                char symbol = '♦';
                System.out.print("Enter the value of DIAMOND card: ");
                int value = in.nextInt();
                if (1 <= value && value <= 13) {
                    createCard(symbol, value);
                    turns--;
                } else {
                    System.out.println("Value is invalid!!!");
                }
            }
            break;
            case 3: {
                char symbol = '♣';
                System.out.print("Enter the value of CLUB card: ");
                int value = in.nextInt();
                if (1 <= value && value <= 13) {
                    createCard(symbol, value);
```

```
                        turns--;
                    } else {
                        System.out.println("Value is invalid!!!");
                    }
                }
                break;
                case 4: {
                    char symbol = '♥';
                    System.out.print("Enter the value of HEART card: ");
                    int value = in.nextInt();
                    if (1 <= value && value <= 13) {
                        createCard(symbol, value);
                        turns--;
                    } else {
                        System.out.println("Value is invalid!!!\n");
                    }
                }
                break;
                default: {
                    System.out.println("WRONG choice");
                }
                break;
            }
        }
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        StartGame game = new StartGame();
        game.playGame(in);
        game.display();
        in.close();
    }
}
```

Result/Output:



```
Enter 1 for SPADE
Enter 2 for DIAMOND
Enter 3 for CLUB
Enter 4 for HEART

Enter your choice: 3
Enter the value of CLUB card: 1

Enter 1 for SPADE
Enter 2 for DIAMOND
Enter 3 for CLUB
Enter 4 for HEART

Enter your choice: 2
Enter the value of DIAMOND card: 2

Four symbols gathered in 8 cards
Cards in Set are:
♠  ->  1
♣  ->  2
♦  ->  2
♥  ->  6
```