Java Assignment 4

Sameer Khatwani

PRN:22070126099

AIML-B1

Write a menu-driven Java Program for the following: There are 52 cards in a deck, each of which belongs to one of four suits and one of 13 ranks.

Should have methods:

a) createDeck() //Can also add this method as constructor

b) printDeck()

c) printCard()

d) sameCard() //Card which is from same suit

e) compareCard() //Card having same rank or number

f) findCard() //Search for particular card

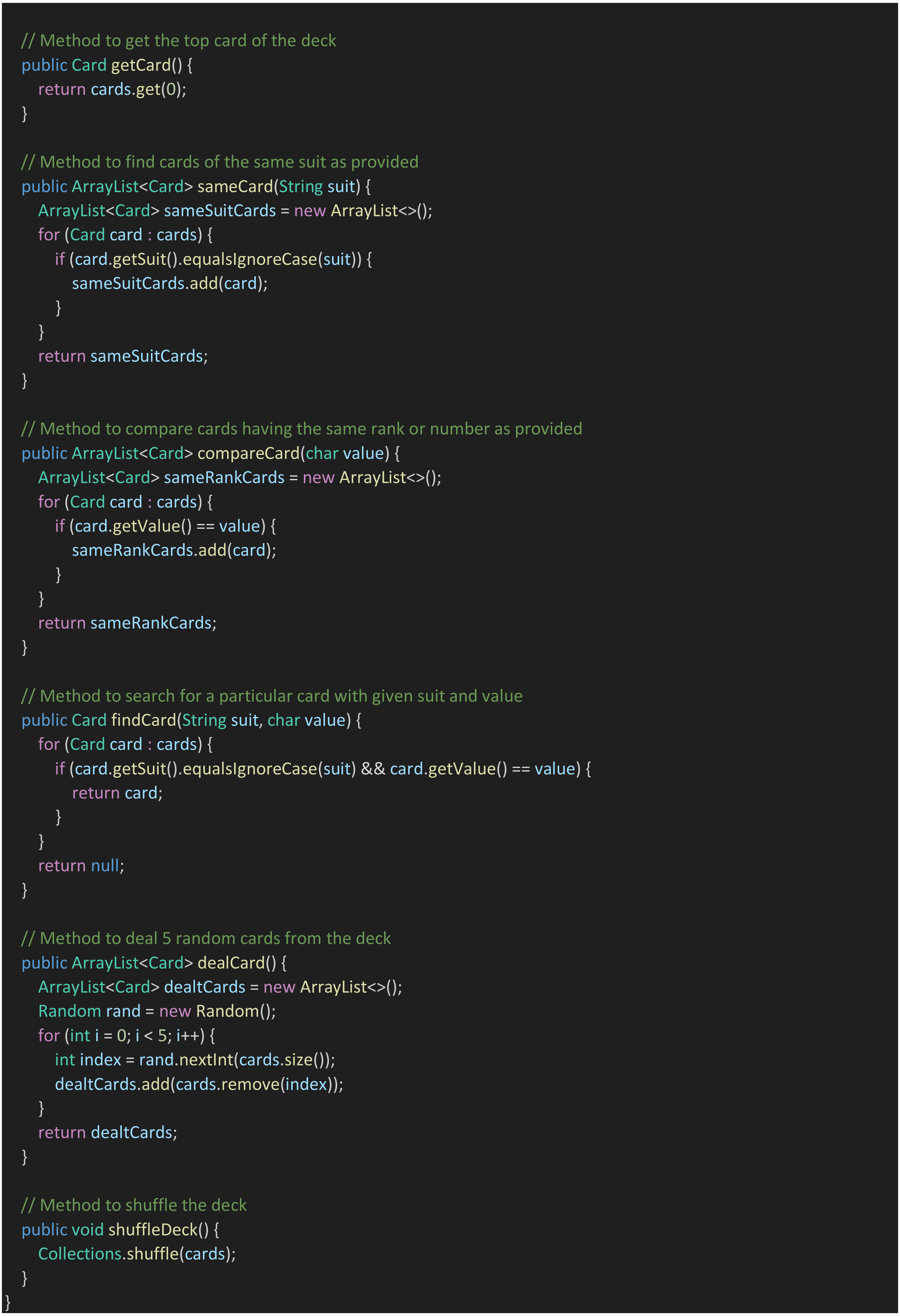
g) dealCard() //Print 5 random cards

h) shuffleDeck() //Randomize the deck

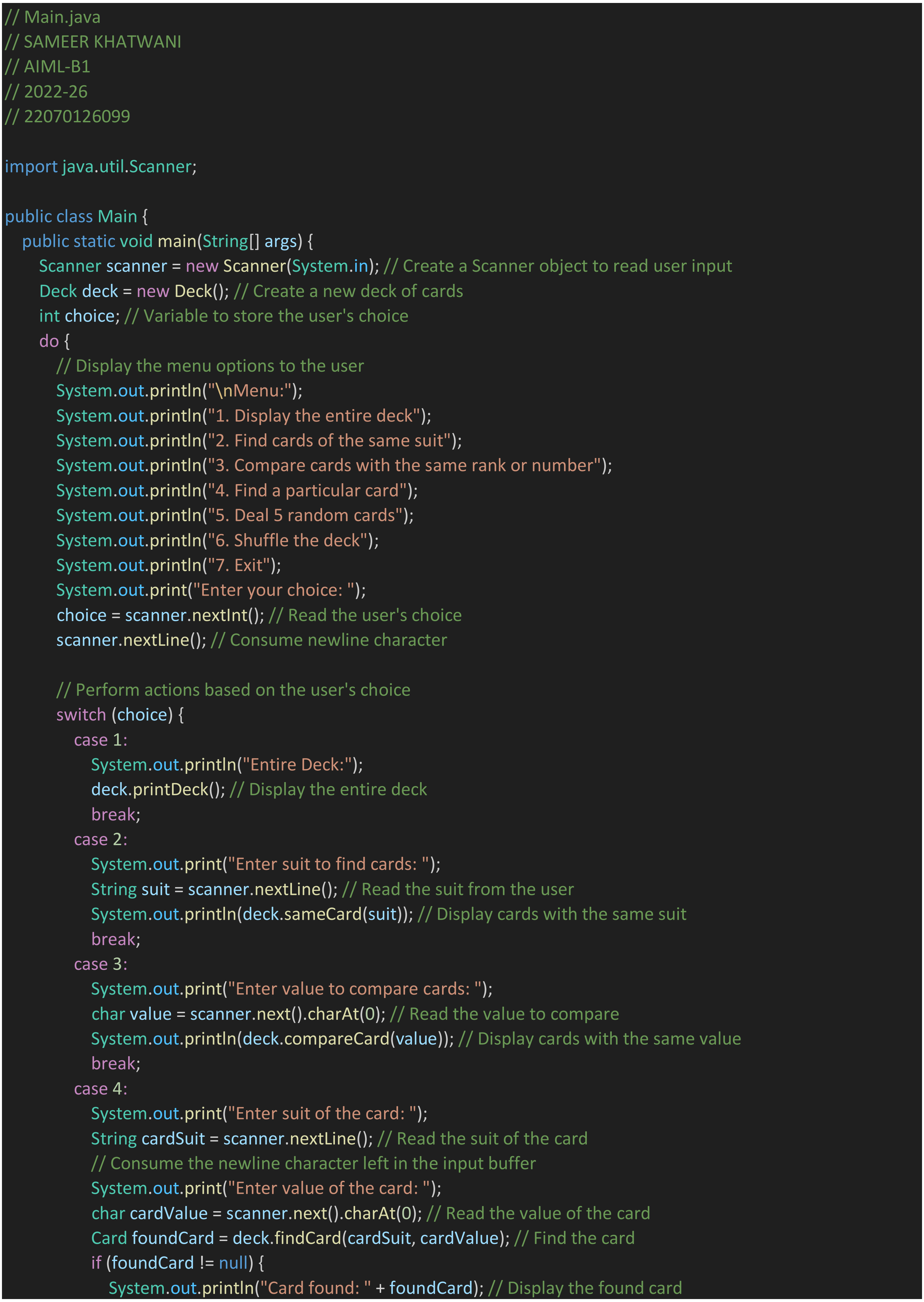
Code:

```
// Card.java
public class Card {
  private char value;
  private String suit;

  // Constructor to initialize card with value and suit
  public Card(char value, String suit) {
    this.value = value;
    this.suit = suit;
  }

  // Getter method to retrieve the value of the card
  public int getValue() {
    return value;
  }

  // Getter method to retrieve the suit of the card
  public String getSuit() {
    return suit;
  }

  // Setter method to set the suit of the card
  public void setSuit(String suit) {
    this.suit = suit;
  }

  // Setter method to set the value of the card
  public void setValue(char value) {
    this.value = value;
  }

  // toString method to represent the card as a string
  @Override
  public String toString() {
    return value + " of " + suit;
  }
}
```

```
//Deck.java
import java.util.*;

public class Deck {
    private ArrayList<Card> cards;

    // Constructor to initialize the deck with 52 cards and shuffle them
    public Deck() {
        this.cards = new ArrayList<Card>();

        // Define possible values and suits for cards
        String[] values = { "A", "2", "3", "4", "5", "6", "7", "8", "9", "10", "J", "Q", "K" };
        String[] suits = { "Hearts", "Diamonds", "Clubs", "Spades" };

        // Create cards for each combination of value and suit
        for (String suit : suits) {
            for (String value : values) {
                char charValue;
                if (value.equals("A") || value.equals("J") || value.equals("Q") || value.equals("K")) {
                    charValue = value.charAt(0);
                } else {
                    charValue = value.charAt(0);
                }
                this.cards.add(new Card(charValue, suit));
            }
        }

        // Shuffle the deck
        Collections.shuffle(this.cards);
    }

    // Method to retrieve the entire deck and print all cards in a line
    public void printDeck() {
        StringBuilder deckString = new StringBuilder();
        for (Card card : cards) {
            deckString.append(card.toString()).append(", ");
            }
        System.out.println(deckString.toString());
    }
```



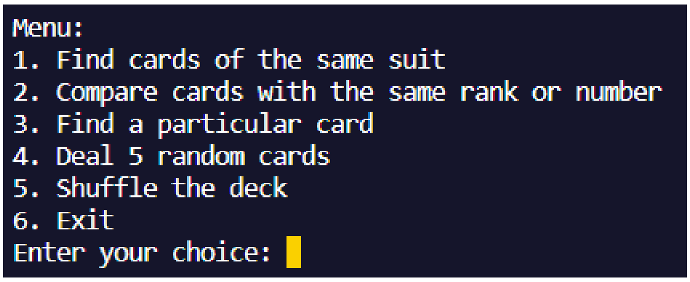
```java
    // Method to get the top card of the deck
    public Card getCard() {
        return cards.get(0);
    }

    // Method to find cards of the same suit as provided
    public ArrayList<Card> sameCard(String suit) {
        ArrayList<Card> sameSuitCards = new ArrayList<>();
        for (Card card : cards) {
            if (card.getSuit().equalsIgnoreCase(suit)) {
                sameSuitCards.add(card);
            }
        }
        return sameSuitCards;
    }

    // Method to compare cards having the same rank or number as provided
    public ArrayList<Card> compareCard(char value) {
        ArrayList<Card> sameRankCards = new ArrayList<>();
        for (Card card : cards) {
            if (card.getValue() == value) {
                sameRankCards.add(card);
            }
        }
        return sameRankCards;
    }

    // Method to search for a particular card with given suit and value
    public Card findCard(String suit, char value) {
        for (Card card : cards) {
            if (card.getSuit().equalsIgnoreCase(suit) && card.getValue() == value) {
                return card;
            }
        }
        return null;
    }

    // Method to deal 5 random cards from the deck
    public ArrayList<Card> dealCard() {
        ArrayList<Card> dealtCards = new ArrayList<>();
        Random rand = new Random();
        for (int i = 0; i < 5; i++) {
            int index = rand.nextInt(cards.size());
            dealtCards.add(cards.remove(index));
        }
        return dealtCards;
    }

    // Method to shuffle the deck
    public void shuffleDeck() {
        Collections.shuffle(cards);
    }
}
```



```java
// Main.java
// SAMEER KHATWANI
// AIML-B1
// 2022-26
// 22070126099

import java.util.Scanner;

public class Main {
  public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in); // Create a Scanner object to read user input
    Deck deck = new Deck(); // Create a new deck of cards
    int choice; // Variable to store the user's choice
    do {
      // Display the menu options to the user
      System.out.println("\nMenu:");
      System.out.println("1. Display the entire deck");
      System.out.println("2. Find cards of the same suit");
      System.out.println("3. Compare cards with the same rank or number");
      System.out.println("4. Find a particular card");
      System.out.println("5. Deal 5 random cards");
      System.out.println("6. Shuffle the deck");
      System.out.println("7. Exit");
      System.out.print("Enter your choice: ");
      choice = scanner.nextInt(); // Read the user's choice
      scanner.nextLine(); // Consume newline character

      // Perform actions based on the user's choice
      switch (choice) {
        case 1:
          System.out.println("Entire Deck:");
          deck.printDeck(); // Display the entire deck
          break;
        case 2:
          System.out.print("Enter suit to find cards: ");
          String suit = scanner.nextLine(); // Read the suit from the user
          System.out.println(deck.sameCard(suit)); // Display cards with the same suit
          break;
        case 3:
          System.out.print("Enter value to compare cards: ");
          char value = scanner.next().charAt(0); // Read the value to compare
          System.out.println(deck.compareCard(value)); // Display cards with the same value
          break;
        case 4:
          System.out.print("Enter suit of the card: ");
          String cardSuit = scanner.nextLine(); // Read the suit of the card
          // Consume the newline character left in the input buffer
          System.out.print("Enter value of the card: ");
          char cardValue = scanner.next().charAt(0); // Read the value of the card
          Card foundCard = deck.findCard(cardSuit, cardValue); // Find the card
          if (foundCard != null) {
            System.out.println("Card found: " + foundCard); // Display the found card
          }
          else {
            System.out.println("Card not found."); // Display message if card not found
          }
          break;
        case 5:
          System.out.println("Dealt cards: " + deck.dealCard()); // Deal 5 random cards
          break;
        case 6:
          deck.shuffleDeck(); // Shuffle the deck
          System.out.println("Deck shuffled.");
          break;
        case 7:
          System.out.println("Exiting..."); // Exit the program
          break;
        default:
          System.out.println("Invalid choice!"); // Display message for invalid choice
      }
    } while (choice != 7); // Repeat until the user chooses to exit
    scanner.close(); // Close the scanner to prevent resource leak
  }
}
```

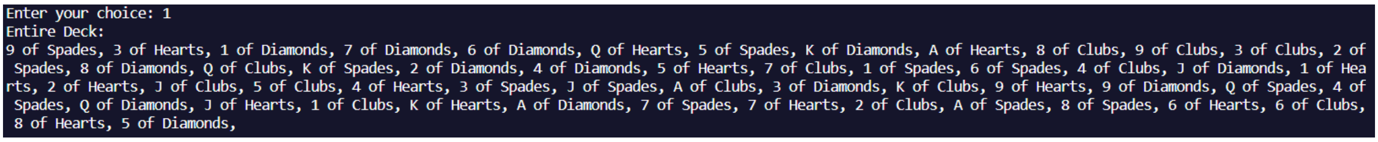
Output:

Menu



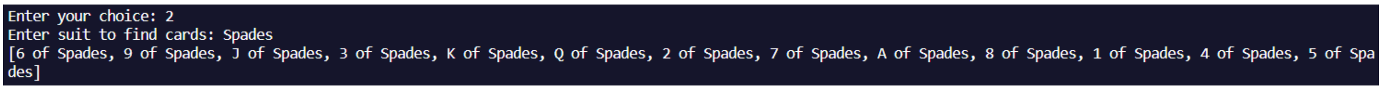
```
Menu:
1. Find cards of the same suit
2. Compare cards with the same rank or number
3. Find a particular card
4. Deal 5 random cards
5. Shuffle the deck
6. Exit
Enter your choice: 
```

Choice 1:



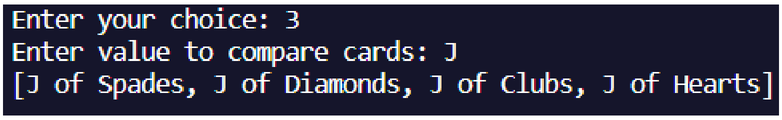
```
Enter your choice: 1
Entire Deck:
9 of Spades, 3 of Hearts, 1 of Diamonds, 7 of Diamonds, 6 of Diamonds, Q of Hearts, 5 of Spades, K of Diamonds, A of Hearts, 8 of Clubs, 9 of Clubs, 3 of Clubs, 2 of
 Spades, 8 of Diamonds, Q of Clubs, K of Spades, 2 of Diamonds, 4 of Diamonds, 5 of Hearts, 7 of Clubs, 1 of Spades, 6 of Spades, 4 of Clubs, J of Diamonds, 1 of Hea
rts, 2 of Hearts, J of Clubs, 5 of Clubs, 4 of Hearts, 3 of Spades, J of Spades, A of Clubs, 3 of Diamonds, K of Clubs, 9 of Hearts, 9 of Diamonds, Q of Spades, 4 of
 Spades, Q of Diamonds, J of Hearts, 1 of Clubs, K of Hearts, A of Diamonds, 7 of Spades, 7 of Hearts, 2 of Clubs, A of Spades, 8 of Spades, 6 of Hearts, 6 of Clubs,
 8 of Hearts, 5 of Diamonds,
```

Choice 2:



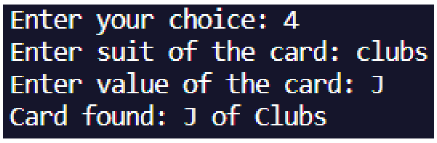
```
Enter your choice: 2
Enter suit to find cards: Spades
[6 of Spades, 9 of Spades, J of Spades, 3 of Spades, K of Spades, Q of Spades, 2 of Spades, 7 of Spades, A of Spades, 8 of Spades, 1 of Spades, 4 of Spades, 5 of Spa
des]
```

Choice 3:



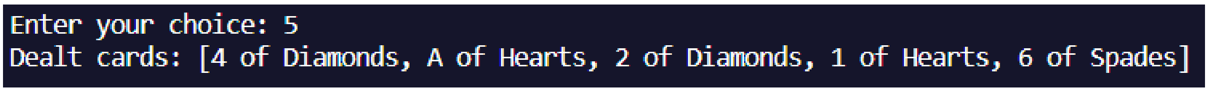
```
Enter your choice: 3
Enter value to compare cards: J
[J of Spades, J of Diamonds, J of Clubs, J of Hearts]
```

Choice 4:



```
Enter your choice: 4
Enter suit of the card: clubs
Enter value of the card: J
Card found: J of Clubs
```

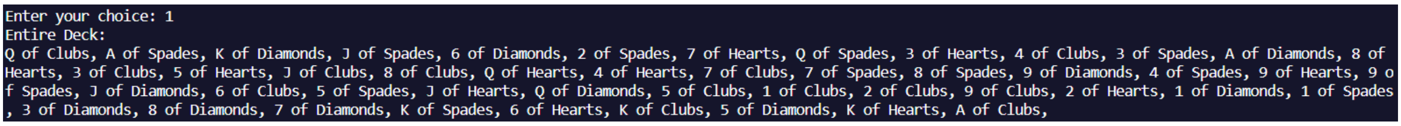
Choice 5:



```
Enter your choice: 5
Dealt cards: [4 of Diamonds, A of Hearts, 2 of Diamonds, 1 of Hearts, 6 of Spades]
```

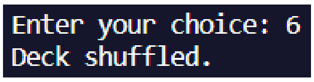
Choice 6:

Previous Deck;



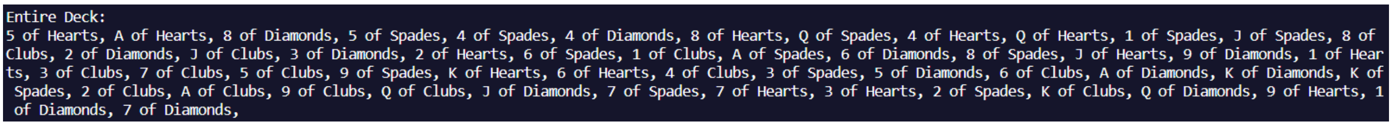
```
Enter your choice: 1
Entire Deck:
Q of Clubs, A of Spades, K of Diamonds, J of Spades, 6 of Diamonds, 2 of Spades, 7 of Hearts, Q of Spades, 3 of Hearts, 4 of Clubs, 3 of Spades, A of Diamonds, 8 of
Hearts, 3 of Clubs, 5 of Hearts, J of Clubs, 8 of Clubs, Q of Hearts, 4 of Hearts, 7 of Clubs, 7 of Spades, 8 of Spades, 9 of Diamonds, 4 of Spades, 9 of Hearts, 9 o
f Spades, J of Diamonds, 6 of Clubs, 5 of Spades, J of Hearts, Q of Diamonds, 5 of Clubs, 1 of Clubs, 2 of Clubs, 9 of Clubs, 2 of Hearts, 1 of Diamonds, 1 of Spades
, 3 of Diamonds, 8 of Diamonds, 7 of Diamonds, K of Spades, 6 of Hearts, K of Clubs, 5 of Diamonds, K of Hearts, A of Clubs,
```

Shuffling;



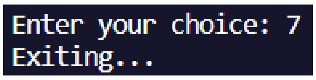
```
Enter your choice: 6
Deck shuffled.
```

New Deck;



```
Entire Deck:
5 of Hearts, A of Hearts, 8 of Diamonds, 5 of Spades, 4 of Spades, 4 of Diamonds, 8 of Hearts, Q of Spades, 4 of Hearts, Q of Hearts, 1 of Spades, J of Spades, 8 of
Clubs, 2 of Diamonds, J of Clubs, 3 of Diamonds, 2 of Hearts, 6 of Spades, 1 of Clubs, A of Spades, 6 of Diamonds, 8 of Spades, J of Hearts, 9 of Diamonds, 1 of Hear
ts, 3 of Clubs, 7 of Clubs, 5 of Clubs, 9 of Spades, K of Hearts, 6 of Hearts, 4 of Clubs, 3 of Spades, 5 of Diamonds, 6 of Clubs, A of Diamonds, K of Diamonds, K of
 Spades, 2 of Clubs, A of Clubs, 9 of Clubs, Q of Clubs, J of Diamonds, 7 of Spades, 7 of Hearts, 3 of Hearts, 2 of Spades, K of Clubs, Q of Diamonds, 9 of Hearts, 1
 of Diamonds, 7 of Diamonds,
```

Choice 7:



```
Enter your choice: 7
Exiting...
```

Github repo

https://github.com/samv28/PIJ