PROGRAMMING IN JAVA LAB-4

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BATCH-AIML A1

Problem: 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. Represent a deck of cards as an array of  
Objects (\*you may use the Vector class)  
1. Use integers to encode the ranks and suits.  
2. Have suitable default & parameterized constructors.  
3. all data members to have private access.  
4. The class ‘Card’ to have the following methods:  
createDeck(), printCard(), printDeck (),sameCard(),compareCard(), sortCard(), findCard() which searches through an array or vector of Cards to see whether it contains a certain card, dealCards() function: to print 5 random cards from the existing deck.

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CODE:

import java.util.Scanner;  
import java.util.Vector;  
import java.util.Random;  
  
class Card {  
 private int rank;  
 private int suit;  
  
 public Card() {  
 this.rank = 0;  
 this.suit = 0;  
 }  
  
 public Card(int rank, int suit) {  
 this.rank = rank;  
 this.suit = suit;  
 }  
  
 public int getRank() {  
 return rank;  
 }  
  
 public int getSuit() {  
 return suit;  
 }  
  
 public void printCard() {  
 String[] suits = {"Spades", "Hearts", "Diamonds", "Clubs"};  
 String[] ranks = {"Ace", "2", "3", "4", "5", "6", "7", "8", "9", "10", "Jack", "Queen", "King"};  
 System.*out*.println(ranks[this.rank] + " of " + suits[this.suit]);  
 }  
  
 public static Vector<Card> createDeck() {  
 Vector<Card> deck = new Vector<Card>();  
 for (int suit = 0; suit < 4; suit++) {  
 for (int rank = 0; rank < 13; rank++) {  
 deck.add(new Card(rank, suit));  
 }  
 }  
 return deck;  
 }  
  
 public static void printDeck(Vector<Card> deck) {  
 for (Card card : deck) {  
 card.printCard();  
 }  
 }  
  
 public boolean sameCard(Card other) {  
 return (this.rank == other.rank && this.suit == other.suit);  
 }  
  
 public int compareCard(Card other) {  
 if (this.rank < other.rank) {  
 return -1;  
 } else if (this.rank > other.rank) {  
 return 1;  
 } else {  
 if (this.suit < other.suit) {  
 return -1;  
 } else if (this.suit > other.suit) {  
 return 1;  
 } else {  
 return 0;  
 }  
 }  
 }  
  
 public static void sortDeck(Vector<Card> deck) {  
 deck.sort((c1, c2) -> c1.compareCard(c2));  
 }  
  
 public static void findCard(Vector<Card> deck, Card card) {  
 for (int i = 0; i < deck.size(); i++) {  
 if (deck.get(i).sameCard(card)) {  
 System.*out*.println("Card found at index " + i);  
 return;  
 }  
 }  
 System.*out*.println("Card not found");  
 }  
  
 public static void dealCards(Vector<Card> deck, int numCards) {  
 Random rand = new Random();  
 for (int i = 0; i < numCards; i++) {  
 int index = rand.nextInt(deck.size());  
 Card card = deck.get(index);  
 card.printCard();  
 deck.remove(index);  
 }  
 }  
}  
  
public class CardDeckGame {  
 public static void main(String[] args) {  
 Scanner input = new Scanner(System.*in*);  
 Vector<Card> deck = Card.*createDeck*();  
  
 while (true) {  
 System.*out*.println("\n--- Menu ---");  
 System.*out*.println("1. Print the deck");  
 System.*out*.println("2. Sort the deck");  
 System.*out*.println("3. Check if two cards are the same");  
 System.*out*.println("4. Find a card");  
 System.*out*.println("5. Deal cards");  
 System.*out*.println("6. Exit");  
 System.*out*.print("Enter your choice (1-6): ");  
 int choice = input.nextInt();  
  
 if (choice == 1) {  
 System.*out*.println("\n--- Deck ---");  
 Card.*printDeck*(deck);  
  
 }else if (choice == 2) {  
 Card.*sortDeck*(deck);  
 System.*out*.println("\n--- Sorted deck ---");  
 Card.*printDeck*(deck);  
  
 } else if (choice == 3) {  
 System.*out*.println("\nEnter the first card:");  
 Card card1 = *readCard*(input);  
 System.*out*.println("Enter the second card:");  
 Card card2 = *readCard*(input);  
 if (card1.sameCard(card2)) {  
 System.*out*.println("The two cards are the same");  
 } else {  
 System.*out*.println("The two cards are different");  
 }  
  
 } else if (choice == 4) {  
 System.*out*.println("\nEnter a card to search for:");  
 Card card = *readCard*(input);  
 Card.*findCard*(deck, card);  
  
 } else if (choice == 5) {  
 System.*out*.println("\nDealing cards...");  
 Card.*dealCards*(deck, 5);  
  
 } else if (choice == 6) {  
 System.*out*.println("Thank You!");  
 break;  
  
 } else {  
 System.*out*.println("Invalid choice, please try again");  
 }  
 }  
 }  
  
 public static Card readCard(Scanner input) {  
 System.*out*.print("Enter rank (0-12): ");  
 int rank = input.nextInt();  
 System.*out*.print("Enter suit (0-3): ");  
 int suit = input.nextInt();  
 return new Card(rank, suit);  
 }  
}

CODE:

Text

Description automatically generated