ELEC 2543 Object-Oriented Programming and Data Structures

Exercise 6a

Topics: Enumerated Types, Arrays

Due Date: Mar 13, 2017

Overview: In this exercise, you will develop a simple playing card game with enumerated types and arrays. A deck of playing cards is maintained as an array of Card objects. The deck is first shuffled. Two cards are from the deck. The game ends with a message telling whether the first card is larger or smaller.

Class Files

Suit.java: This file defines the enumerated class for the possible suits in a deck of cards. You should not modify this file.

The order of the suits is: Spade > Heart > Club > Diamond

Rank.java: This file defines the enumerated class for the possible ranks in a deck of cards. You should not modify this file.

The order of the ranks is: Ace > King > Queen > Jack > 10 > … > 2

Card.java: This is the class file for a single playing card. You should put in necessary instance variables and methods according to the instructions below.

PlayCard.java: This is the driver program for this exercise. It first creates an array of cards representing a deck of cards and shuffles the deck. Afterwards, two cards are randomly drawn from the deck and compared. You should follow the instructions below to complete the implementation.

Class Card

Ace of Spades is the largest card, and Two of Diamonds is the smallest card.

Define the class according to the following:

1. Define appropriate instance variables in Card.java for the rank and suit of the card.
2. Define necessary constructors.
3. Implement an appropriate toString method. You can refer to the sample output for the format of printing a card. Note that toString method has been defined in both Rank and Suit.
4. Develop a method for comparing the current Card object with another Card object. Name the method public int compareTo(Card c). Details of the method can be found in the class file.
5. You can define other methods. You have to apply the appropriate visibility modifiers for all methods and instance variables.

Driver PlayCard.java

We put the cards in an array to represent a deck. To shuffle the cards, we swap the cards in the array at random. You should use the appropriate method defined in class Card to compare the cards. Please follow the following to implement the program.

1. Array cards[] has been declared for you. Instantiate it appropriately. Use values() and length of enumerated types smartly to determine the size of the array.
2. Put a copy of each possible card in the array.
3. Implement method shuffle. You can verify the results by looking at the output.
4. Randomly select two cards and assign them as c1 and c2.
5. Compare them and print out the result.

Sample Output

Below is a sample output of the program.

Number of cards in the deck: 52

Before shuffling:

S2 S3 S4 S5 S6 S7 S8 S9 S10 SJ SQ SK SA H2 H3 H4 H5 H6 H7 H8 H9 H10 HJ HQ HK HA C2 C3 C4 C5 C6 C7 C8 C9 C10 CJ CQ CK CA D2 D3 D4 D5 D6 D7 D8 D9 D10 DJ DQ DK DA

After shuffling:

S2 S3 DK S5 S6 SA CQ D9 S10 SJ H2 CJ S7 SQ H3 H4 H5 H6 C2 H8 H9 SK HJ HQ HK DA H7 C3 C4 C5 C6 C7 C8 DJ C10 D7 S4 CK CA D2 D3 D4 D5 D6 H10 D8 HA D10 C9 DQ S8 S9

Two cards are drawn:

c1 = H3 and c2 = C4

H3 is smaller than C4

Handin

Submit your Card.java, and PlayCard.java to Moodle before the deadline.