ELEC 2543 Object-Oriented Programming and Data Structures

Programming Exercise 8 (Part I)

Topics: Inheritance

Released on: 26 March 2021 (Friday)

Due Date: 9:30am, April 13, 2021 (Tuesday)

Overview: In this exercise, you will develop a simple playing card game. Players would have different strategies in playing the game.

The Game

There are several players. In the beginning of the game, each player takes turn to draw a card from a deck of cards until each player has numRounds cards. The game then proceeds in rounds. In each round, each player plays a card according to his/her strategy. Messages telling the card each player plays in each round are printed out. The player who plays the largest card is also identified.

Players

There are two kinds of players who use two different strategies. Players in one group always play the smallest card. Players in the other group always play the largest card. We will apply inheritance to develop different classes to represent different groups of players.

class Player is the base class for all players and the skeleton has been provided. Define this class according to the following:

1. method public void addCard(Card card) adds a new card to the arraylist of Card. The arraylist is arranged from smallest card to the largest card. To facilitate card comparisons, use class Card you developed in Lab 5. [Note: you do not have to sort the cards. You SHOULD NOT call any libraries for sorting. Instead, identify the right position to insert the card whenever you add a new card to your list.]
2. You can define other methods but not define other instance variables. You can modify the visibility modifier of the instance variables.

class LCPlayer is derived from class Player. It represents players who always play the largest card. Class SCPlayer represents players who always play the smallest card. Define method public Card playCard() for playing a card according to the corresponding strategy. Define these two classes without declaring any instance variable but define appropriate methods.

class CardGame2

The game logic is implemented in the play() method. Cards have been distributed to the players in the parameter. You do not have to distribute cards to them again. Details of the players can be found in InitializePlayer.java.

Without defining any new instance variable, implement method play() so that:

1. In each round, first print out the cards each player has in ascending order.
2. Then, print out what card each player plays this round.
3. The winner is identified.

After you have developed the classes for players and CardGame2, use CardGame2Driver.java to test your program. The sample output has been provided.

submit your Card.java, Player.java, LCPlayer.java, SCPlayer.java, CardGame2.java to VPL