ELEC 2543 Object-Oriented Programming and Data Structures

Assignment 2

Due Date: Apr 28, 2017

Overview: In this assignment, you are going to simulate two simplified card games: Sevens and Big Two. Both games are for 3 – 6 players. The game rules of the two games share some similarities. You are going to apply the object-oriented design to develop the program.

The Card Games

*Similarities*

* In the beginning of the game, the whole deck is evenly (if possible) distributed among all players. Some players may get one more card than others.
* The player who gets a certain card (game specific) will be the first player
* Starting from the first player, each player (from smaller id to higher id) takes turn to play a card according to the game rules.
* As the game rules restrict only some cards can be played, the player may need to “PASS” in his turn if he does not have any eligible card to play
* The player who plays all his cards wins the game

*Big Two (Simplified version)*

The largest rank in the deck is Two, followed by Ace, King, Queen, etc. The smallest rank is 3. That is, the card rank is: S2 > H2 > C2 > D2 > SK > … > S3 > H3 > C3 > D3.

The game proceeds in rounds. The player with the smallest card (D3) is the first player of the first round. Each player can only deal a card bigger than the most recently dealt card in this round. If all players (except the player of the most recently dealt card) do not have a card to play, this round is ended, and the player of the most recently dealt card wins this round. To start the next round, the winner of the previous round plays a card.

There are many strategies to determine which card to deal. In this assignment, a player always deals a card that is just big enough to deal. For example, if the current card is H7 and this player has three cards (H8, H2, and S2), this player will play H8. The winner of a round would play the smallest card he has to start a new round.

*Sevens*

The card rank in this game is for players to sort their cards in their hands. SPADE < HEART < CLUB < DIAMOND. A < 2 < 3 < … < 10 < J < Q < K. That is, the card rank is: SA < S2 < S3 < … < SQ < SK < HA < H2 < … < HK < CA < C2 < C3 <… < CQ < CK < DA < D2 < … < DK.

Cards will line up in sequence according to suit on the table. Player can only put a card in sequence of the cards on table. Rank 7 is the starting card of each suit. The player with H7 is the first player. That is, after the first player deals H7, the next player can only play a card from set {H6, H8, S7, C7, D7}. If he does not have a suitable card, he has to “PASS.” The sequence is A to 7 and 7 to K (A is put after 2, but not K).

You can develop your own strategy to play this game.

Implementation

Classes Rank.java, Suit.java, Card.java, and A2Deck.java have been provided. You should not modify these files in this assignment.

Extend A2Deck to classes Big2Deck and SevensDeck. Provide the appropriate implementation of method public int cardRank(Card card).

Class A2Player.java is an abstract class that represents players of a certain card game. Implement method public void distributeAllCards(). New methods can be defined as needed.

Class A2CardGame.java is an abstract class that represents card games. New methods can be defined as needed. Implement classes Big2Game and SevensGame to simulate the games.

GameDriver.java demonstrates how to play the two games. This file should give you hints on what other classes you have to develop. We will use our own driver program to test your submission.

Output

Sample outputs of the two games are provided. You do not have to following strictly the output spacing. However, your output should be readable and the format should not deviate a lot from the provided sample outputs.

big2.output.txt

The output is divided into sessions of different rounds. In each round, the cards each player has are first displayed, followed by what card each player deals.

sevens.output.txt

The game first displays the cards each player has and who has the card H7. Next, the table will be shown. null…null means there is no card played for that suit. The cards each player has follow the table. The next line tells 6 cards that are played by the players. PASS is not counted as a card dealt.

Handin

Submit all your Java files in a single zip file and submit to Moodle.