CS215: Introduction to Program Design, Abstraction and Problem Solving
(Fall, 2021)
Programming Assignment 3
(100 points)
Today's Date: Tuesday, November 16
Due Date: December 5

How will you and the grader test running your program?

Testing Case 1: Similar to one of the testing case you observed in Lab11, the cards on the deck will be created from calling createDeck() member function of Deck class, without calling shuffleDeck() member function. And the cards will be in the order when it has been created from createDeck() member function. Your program will repeatedly deal one card to player1 and player2, respectively, until each player holds 26 cards in hand. It leads to each player has the same sequence of cards according to the card points (ignore suits), and this generates the extreme case of War Game: at each play, two players will play exactly matched pair of cards, which causes a "War", each player places three cards (face down) on the table and play another card (face up), then another "War"…until all the cards are placed on the table, your program should report a tie game.

Testing Case 2: The cards on the deck will be created from calling createDeck() member function of Deck class, then calling shuffleDeck() member function. This is more like the "real world" War game, cards are always shuffled before dealing cards to each player. Under this testing case, after each round (a round starts from each player playing a card till it has been decided which player gets all cards on the table), your program needs to ask the user whether to continue the game or not. After 8 rounds, the user needs to click "n" from keyboard to quit the game.

Testing Case 3: All are the same as Testing Case 2, except you need to "comment out" the block of statement where your program needs to ask the user for input, instead let the program continue playing War game, without collecting user input, until it stops and makes a decision of which player wins the game or it is a tie game.

The following shows the sample outputs under three testing cases (Note that your output needs to exactly match the output from testing case 1; should be different from testing cases 2 and 3, due to the cards on the deck being shuffled)

Note the blue part is what the user types from the keyboard, ↵ represents the "return" key.

Testing Case 1:

```
Player 1 plays: ♠ A♠
Player 2 plays: ♣ A♣
----------------------------------------------

There are 2 cards on the pile!
```

```
-------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
-------------------------------------------------

There are 8 cards on the pile!

-------------------------------------------------
Player1 has 22 cards in hand!
Player2 has 22 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♠ Q♠
Player 2 plays: ♣ Q♣
-------------------------------------------------

There are 10 cards on the pile!

-------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
-------------------------------------------------

There are 16 cards on the pile!

-------------------------------------------------
Player1 has 18 cards in hand!
Player2 has 18 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♠10♠
Player 2 plays: ♣10♣
-------------------------------------------------

There are 18 cards on the pile!

-------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
```

```
--------------------------------------------------

There are 24 cards on the pile!

--------------------------------------------------
Player1 has 14 cards in hand!
Player2 has 14 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♠ 8♠
Player 2 plays: ♣ 8♣
--------------------------------------------------

There are 26 cards on the pile!

--------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
--------------------------------------------------

There are 32 cards on the pile!

--------------------------------------------------
Player1 has 10 cards in hand!
Player2 has 10 cards in hand!


Do you want to continue...for the next round? (N or n to
quit)
Player 1 plays: ♠ 6♠
Player 2 plays: ♣ 6♣
--------------------------------------------------

There are 34 cards on the pile!

--------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
--------------------------------------------------

There are 40 cards on the pile!

--------------------------------------------------
```

```
Player1 has 6 cards in hand!
Player2 has 6 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♠ 4♠
Player 2 plays: ♣ 4♣
------------------------------------------------

There are 42 cards on the pile!

------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
------------------------------------------------

There are 48 cards on the pile!

------------------------------------------------
Player1 has 2 cards in hand!
Player2 has 2 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♠ 2♠
Player 2 plays: ♣ 2♣
------------------------------------------------

There are 50 cards on the pile!

------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
Game is over!
It is a tie game!
Player1 has 1 cards in hand!
Player2 has 1 cards in hand!
```

Testing Case 2:

```
Player 1 plays: ♦ 2♦
Player 2 plays: ♠ Q♠
------------------------------------------------
```

There are 2 cards on the pile!

Player 2 wins...get all cards from the pile!
Player1 has 25 cards in hand!
Player2 has 27 cards in hand!

Do you want to continue...for the next round? (N or n to quit) ↵
Player 1 plays: ♦ A♦
Player 2 plays: ♥ 5♥

There are 2 cards on the pile!

Player 1 wins...get all cards from the current round!
Player1 has 26 cards in hand!
Player2 has 26 cards in hand!

Do you want to continue...for the next round? (N or n to quit) ↵
Player 1 plays: ♦10♦
Player 2 plays: ♣10♣

There are 2 cards on the pile!

It is a tie...for this round!
Each player drops three cards (face down) on the pile, then play one more card (face up)

There are 8 cards on the pile!

Player1 has 22 cards in hand!
Player2 has 22 cards in hand!

Do you want to continue...for the next round? (N or n to quit) ↵
Player 1 plays: ♣ A♣

Player 2 plays: ♦ 7♦

There are 10 cards on the pile!

Player 1 wins...get all cards from the current round!
Player1 has 31 cards in hand!
Player2 has 21 cards in hand!

Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♣ 4♣
Player 2 plays: ♦ J♦

There are 2 cards on the pile!

Player 2 wins...get all cards from the pile!
Player1 has 30 cards in hand!
Player2 has 22 cards in hand!

Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♦ 6♦
Player 2 plays: ♠ 2♠

There are 2 cards on the pile!

Player 1 wins...get all cards from the current round!
Player1 has 31 cards in hand!
Player2 has 21 cards in hand!

Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♣ 7♣
Player 2 plays: ♠ A♠

There are 2 cards on the pile!

```
-------------------------------------------------
Player 2 wins...get all cards from the pile!
Player1 has 30 cards in hand!
Player2 has 22 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♠ K♠
Player 2 plays: ♥ 6♥
-------------------------------------------------

There are 2 cards on the pile!

-------------------------------------------------
Player 1 wins...get all cards from the current round!
Player1 has 31 cards in hand!
Player2 has 21 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) ↵
Player 1 plays: ♦ 9♦
Player 2 plays: ♠ 3♠
-------------------------------------------------

There are 2 cards on the pile!

-------------------------------------------------
Player 1 wins...get all cards from the current round!
Player1 has 32 cards in hand!
Player2 has 20 cards in hand!


Do you want to continue...for the next round? (N or n to
quit) n↵
You choose to quit the game!
Player1 has 32 cards left!
Player2 has 20 cards left!
```

Testing Case 3:

```
Player 1 plays: ♥ 6♥
Player 2 plays: ♠ 8♠
-------------------------------------------------

There are 2 cards on the pile!
```

```
--------------------------------------------------
Player 2 wins...get all cards from the pile!
Player1 has 25 cards in hand!
Player2 has 27 cards in hand!


Player 1 plays: ♣ 3♣
Player 2 plays: ♦ J♦
--------------------------------------------------

There are 2 cards on the pile!

--------------------------------------------------
Player 2 wins...get all cards from the pile!
Player1 has 24 cards in hand!
Player2 has 28 cards in hand!


Player 1 plays: ♠ Q♠
Player 2 plays: ♠ J♠
--------------------------------------------------

There are 2 cards on the pile!

--------------------------------------------------
Player 1 wins...get all cards from the current round!
Player1 has 25 cards in hand!
Player2 has 27 cards in hand!


Player 1 plays: ♠ 6♠
Player 2 plays: ♥ 5♥
--------------------------------------------------

There are 2 cards on the pile!

--------------------------------------------------
Player 1 wins...get all cards from the current round!
Player1 has 26 cards in hand!
Player2 has 26 cards in hand!


Player 1 plays: ♣ J♣
Player 2 plays: ♥ 3♥
--------------------------------------------------
```

There are 2 cards on the pile!

Player 1 wins...get all cards from the current round!
Player1 has 27 cards in hand!
Player2 has 25 cards in hand!

Player 1 plays: ♠ 9♠
Player 2 plays: ♥10♥

There are 2 cards on the pile!

Player 2 wins...get all cards from the pile!
Player1 has 26 cards in hand!
Player2 has 26 cards in hand!

Player 1 plays: ♦ 3♦
Player 2 plays: ♥ Q♥

There are 2 cards on the pile!

Player 2 wins...get all cards from the pile!
Player1 has 25 cards in hand!
Player2 has 27 cards in hand!

Player 1 plays: ♥ A♥
Player 2 plays: ♥ J♥

There are 2 cards on the pile!

Player 1 wins...get all cards from the current round!
Player1 has 26 cards in hand!
Player2 has 26 cards in hand!

Player 1 plays: ♥ 2♥
Player 2 plays: ♠10♠

There are 2 cards on the pile!

Player 2 wins...get all cards from the pile!
Player1 has 25 cards in hand!
Player2 has 27 cards in hand!

Player 1 plays: ♠ Q♠
Player 2 plays: ♥ A♥

There are 2 cards on the pile!

Player 2 wins...get all cards from the pile!
Player1 has 44 cards in hand!
Player2 has 8 cards in hand!

(omit quite a few rounds in the middle)
......

Player 1 plays: ♦10♦
Player 2 plays: ♥10♥

There are 2 cards on the pile!

It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)

There are 8 cards on the pile!

Player1 has 40 cards in hand!
Player2 has 4 cards in hand!

Player 1 plays: ♦ 7♦
Player 2 plays: ♠ 7♠

There are 10 cards on the pile!

```
--------------------------------------------------
It is a tie...for this round!
Each player drops three cards (face down) on the pile, then
play one more card (face up)
--------------------------------------------------

There are 16 cards on the pile!

--------------------------------------------------
Player1 has 36 cards in hand!
Player2 has 0 cards in hand!


Game is over!
Player 1 wins the game!
```