Card Game API Documentation

Class name: CardGame

Funtions:

1) __init__(self, card_number, suits, points, deck_number): Initiate a Card Game

   Parameters:

   card_number: A list including the number of cards for each suit in one deck

   suits: A list including unique suits in one deck

   points: A dictionary including suit-point pair to determine play winner

   deck_number: an integer no less than 1 which indicate the number of decks to play

   Example (Test Case 1):

   Input:

   *from CardGame import ***

   cardgame = CardGame(card_number=[2, 4, 6], suits=['red', 'yellow', 'green'],
   points={'red': 3, 'yellow': 2, 'green': 1}, deck_number=1)

   print("cards=", cardgame.cards, '\n')

   print("suits=", cardgame.suits, '\n')

   print("points=", cardgame.points, '\n')

   print("deck number=", cardgame.deck_number)

   Output:

   cards= [('red', 0), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3),
   ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4), ('green', 5)]

   suits= ['red', 'yellow', 'green']

   points= {'red': 3, 'yellow': 2, 'green': 1}

   deck number= 1

   Explanation:

   Initiate a Card Game object named "cardgame".

   In each deck of cards in the game, there are 3 suits, including 2 "red" cards, 4 "yellow" cards, and 6 "green" cards.

   The suit-point calculation in the play follow the rule: "red" = 3, "yellow" = 2, "green" = 1.

   In each play of the game, there is only deck of cards to play.

2) shuffleCards(self, seed=None): Shuffle cards in the deck
   Parameters:

       seed: A value to reproduce the random shuffle result.

           Default value is None, under which case, the shuffle result is not reproducible and unpredictable.

           By re-using a seed value, the same sequence should be reproducible from run to run as long as multiple threads are not running.

   Example (Test Case 6):
       Input:
   *from CardGame import ***

   *cardgame = CardGame(card_number=[2, 4, 6], suits=['red', 'yellow', 'green'],
           points={'red': 3, 'yellow': 2, 'green': 1}, deck_number=1)*

   print("Original Cards=", cardgame.cards, '\n')

   cardgame.shuffleCards(seed=1)

   print("Shuffled Cards=", cardgame.cards, '\n')

   Output:
   Original Cards= [('red', 0), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4), ('green', 5)]

   Shuffled Cards= [('green', 4), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('red', 0), ('green', 3), ('green', 5)]

   Explanation:
       Initiate a Card Game object named "cardgame" with *Original Cards*.
       After reproducibly randomly shuffling with seed=1, the cards are *Shuffled Cards.*

       Note: if the "seed" parameter is not implicitly set or set as "None" when calling the shuffuleCard(), the shuffling result is random and not reproducible.

3) dealCard(self): Get a card from the top of the deck
   Parameters: None

   Example (Test Case 3):
       Input:
   *from CardGame import ***

*cardgame = CardGame(card_number=[2, 4, 6], suits=['red', 'yellow', 'green'],
            points={'red': 3, 'yellow': 2, 'green': 1}, deck_number=1)*

print("Original Cards=", cardgame.cards)

print("Card Number=", len(cardgame.cards), '\n')

deal_card = cardgame.dealCard()

print("Deal Card=", deal_card)

print("Cards=", cardgame.cards)

print("Card Number=", len(cardgame.cards), '\n')

Output:

Original Cards= [('red', 0), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4), ('green', 5)]
Card Number= 12

Deal Card= ('green', 5)
Cards= [('red', 0), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4)]
Card Number= 11

Explanation:
A Card Game object is created with one deck of cards and the top card is ('green', 5)].
After calling cardgame.dealCard(), the top card is dealt.

4) sortCards(self, suits_order): Sort cards
   Parameters:
   suits_order: a list of suits, according to which the cards left in the deck are sorted first and the cards of the same suit are sorted in ascending order afterwards.

   Example(Case 4):
   Input:
   *cardgame = CardGame(card_number=[2, 4, 6], suits=['red', 'yellow', 'green'],
            points={'red': 3, 'yellow': 2, 'green': 1}, deck_number=1)*

   print("Original Cards=", cardgame.cards, '\n')

   cardgame.shuffleCards(seed=1)

```
print("Shuffled Cards=", cardgame.cards, '\n')

cardgame.sortCards(suits_order=["yellow", "green", "red"])

print("Sorted Cards=", cardgame.cards)
```

Output:
Original Cards= [('red', 0), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4), ('green', 5)]

Shuffled Cards= [('green', 1), ('green', 5), ('red', 0), ('green', 2), ('yellow', 3), ('green', 0), ('yellow', 1), ('green', 4), ('yellow', 2), ('red', 1), ('green', 3), ('yellow', 0)]

Sorted Cards= [('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4), ('green', 5), ('red', 0), ('red', 1)]

Explanation:
A Card Game is initiated with one deck of cards with 3 suits: 2 "red" cards, 4 "yellow" cards, 6 "green" cards.
Shuffle cards with seed=1, so that the shuffling result is reproducible and predictable.
Sort the shuffled cards in the order that "yellow" cards before "green" cards before "red" cards, and cards of the same suit are sorted in ascending order of their numbers.

5) play(self): Determine winner between two players
   Parameters: None

   Example(Test Case 5):
   Input:
   *from CardGame import ***

   cardgame = CardGame(card_number=[2, 4, 6], suits=['red', 'yellow', 'green'], points={'red': 3, 'yellow': 2, 'green': 1}, deck_number=1)

   print("Original Cards=", cardgame.cards, '\n')

   cardgame.play()

   Output:

Original Cards= [('red', 0), ('red', 1), ('yellow', 0), ('yellow', 1), ('yellow', 2), ('yellow', 3), ('green', 0), ('green', 1), ('green', 2), ('green', 3), ('green', 4), ('green', 5)]

Card Suit - Point: {'red': 3, 'yellow': 2, 'green': 1}

Player 1's cards: [('green', 5), ('green', 3), ('green', 1)]
Player 2's cards: [('green', 4), ('green', 2), ('green', 0)]

Player 1 Wins!(Points: 9)

Explanation:
A Card Game is initiated with a deck of cards: 2 "red" cards, 4 "yellow" cards, 6 "green" cards.
Two players play a game by alternatively take the top card from the deck with player 1 taking first, and the cards taken by each player is as follows:

Player 1's cards: [('green', 5), ('green', 3), ('green', 1)]
Player 2's cards: [('green', 4), ('green', 2), ('green', 0)]

The suit-point matching is assigned as "red"=3, "yellow"=2, "green"=1.
The score for player 1 is 1 * 5 + 1 * 3+ 1 * 1 = 9 points.
The score for player 2 is 1 * 4 + 1 * 2 + 1 * 0 = 6 points.
Player 1's score is greater than Player 2's score.
Therefore, Player 1 wins!