CPSC 1301, Computer Science I Programming Exercise 05

Week 05, Cards

1 Introduction

This activity consists of three programming exercises. The following exercises are open book and open note. You are free to use any written documentation you wish. However, these are individual exercises, and you cannot consult with each other in writing your programs. Name your program `Cards_lastname.py`.

This programming exercise has three parts. The grade for each requirement is indicated, for a maximum of 100 points. At a minimum, your program must compile successfully and run. This exercise uses Python lists. You are required to implement the functions using lists.

A starter template is shown below, but you do not have to use this. A sample output is also shown, and your exercise output must be similar to this output.

2 Exercise requirements

You are to implement three functions: `getNewDeck()`, `getShuffledDeck()`, and `getHands()`.

getNewDeck will take no parameters and will return a list containing 52 items. Each item will be a "card" with a value and a suit, such as the `5 of Clubs` or the `Jack of Hearts`. The list will be a sorted list from the `2 of Clubs` to the `Ace of Spades`. Implement this function with two local lists, one representing the four suits, and the second representing the 13 values. Initialize the return list using two nested loops.

getShuffledDeck will take one parameter, the new, sorted deck returned by the previous function, and return a shuffled deck. The shuffling must be randomized. See the discussion of `random.randint()` below. One way to do this is to iterate through the list, generating a random integer for each item, and swapping the current item for the random element. Another way would be to remove a random "card" from the new deck and append it to the shuffled deck, stopping when the new deck is empty. *Do not use any builtin methods — you must implement this by hand from scratch!*

getHands will take one parameter, the shuffled deck returned by the previous function, and return a tuple of four lists named `north`, `east`, `south`, and `west`. This function will be responsible for taking the shuffled deck and dealing the deck into four hands of 13 cards each.

random.randint Please check the documentation and make sure you know how to use this. Note that the starter template imports this method on line 7. The documentation states: " **random.randint(a, b)** Return a random integer N such that $a \leq N \leq b$."

3 Starter template

```
1  #!python
2  # Name: Cards.py
3  # Author: Your Name
4  # Date: current date
5  # Purpose: this is the Cards exercise, list operations
6
7  from random import randint
```

```
8
9  def hello():
10     print("Hello from 'Cards.py'")
11
12 def getNewDeck():
13     print( "called getNewDeck()")
14     pass
15
16 def getShuffledDeck(nd):
17     print( "called getShuffledDeck(newDeck)")
18     pass
19
20 def getHands(sd):
21     print ('called getHands(shuffledDeck) returns ("north","east","south","west")')
22     pass
23
24 #main function executes the defined functions
25 if __name__ == '__main__':
26     hello()
27     newDeck = getNewDeck()
28     print(newDeck)
29     shuffledDeck = getShuffledDeck(newDeck)
30     print(shuffledDeck)
31     (north, east, south, west) = getHands(shuffledDeck)
32     print("\n", "North:", north)
33     print("\n", "East:", east)
34     print("\n", "South:", south)
35     print("\n", "West:", west)
```

4 Sample output

```
Hello from 'Cards.py'
called getNewDeck()
['2 of Clubs', '3 of Clubs', '4 of Clubs', '5 of Clubs', '6 of Clubs', '7 of Clubs', '8 of Clubs',
    '9 of Clubs', '10 of Clubs', 'Jack of Clubs', 'Queen of Clubs', 'King of Clubs', 'Ace of Clubs',
    '2 of Diamonds', '3 of Diamonds', '4 of Diamonds', '5 of Diamonds', '6 of Diamonds', '7 of Diamonds',
    '8 of Diamonds', '9 of Diamonds', '10 of Diamonds', 'Jack of Diamonds', 'Queen of Diamonds',
    'King of Diamonds', 'Ace of Diamonds', '2 of Hearts', '3 of Hearts', '4 of Hearts', '5 of Hearts',
    '6 of Hearts', '7 of Hearts', '8 of Hearts', '9 of Hearts', '10 of Hearts', 'Jack of Hearts',
    'Queen of Hearts', 'King of Hearts', 'Ace of Hearts', '2 of Spades', '3 of Spades', '4 of Spades',
    '5 of Spades', '6 of Spades', '7 of Spades', '8 of Spades', '9 of Spades', '10 of Spades',
    'Jack of Spades', 'Queen of Spades', 'King of Spades', 'Ace of Spades']
called getShuffledDeck(newDeck)
['9 of Diamonds', 'King of Diamonds', 'King of Clubs', '9 of Clubs', 'Ace of Diamonds', 'King of Hearts',
    'Queen of Diamonds', '3 of Clubs', '6 of Diamonds', 'Ace of Spades', '7 of Hearts', '2 of Clubs',
    '10 of Hearts', '5 of Hearts', '9 of Hearts', '7 of Spades', '8 of Spades', '8 of Clubs', 'Jack of Hearts',
    'Queen of Clubs', '5 of Diamonds', '4 of Clubs', '5 of Spades', '7 of Clubs', 'King of Spades',
    '3 of Hearts', '4 of Spades', '3 of Diamonds', '4 of Hearts', '10 of Spades', '4 of Diamonds',
    'Queen of Spades', '2 of Diamonds', '5 of Clubs', 'Ace of Hearts', '3 of Spades', '7 of Diamonds',
    '2 of Spades', '6 of Clubs', '8 of Diamonds', '10 of Diamonds', 'Jack of Spades', '6 of Spades',
    'Ace of Clubs', 'Queen of Hearts', '10 of Clubs', '2 of Hearts', '6 of Hearts', 'Jack of Clubs',
    '9 of Spades', 'Jack of Diamonds', '8 of Hearts']
called getHands(shuffledDeck) returns ("north","east","south","west")

 North: ['9 of Diamonds', 'Ace of Diamonds', '6 of Diamonds', '10 of Hearts', '8 of Spades', '5 of Diamonds',
 'King of Spades', '4 of Hearts', '2 of Diamonds', '7 of Diamonds', '10 of Diamonds', 'Queen of Hearts', 'Jack of Clubs']

 East: ['King of Diamonds', 'King of Hearts', 'Ace of Spades', '5 of Hearts', '8 of Clubs', '4 of Clubs',
 '3 of Hearts', '10 of Spades', '5 of Clubs', '2 of Spades', 'Jack of Spades', '10 of Clubs', '9 of Spades']

 South: ['King of Clubs', 'Queen of Diamonds', '7 of Hearts', '9 of Hearts', 'Jack of Hearts', '5 of Spades',
 '4 of Spades', '4 of Diamonds', 'Ace of Hearts', '6 of Clubs', '6 of Spades', '2 of Hearts', 'Jack of Diamonds']

 West: ['9 of Clubs', '3 of Clubs', '2 of Clubs', '7 of Spades', 'Queen of Clubs', '7 of Clubs', '3 of Diamonds',
 'Queen of Spades', '3 of Spades', '8 of Diamonds', 'Ace of Clubs', '6 of Hearts', '8 of Hearts']
```