COP 2535: Data Structures

Exercise 06, Cards

1   Instructions

You will implement a deck of cards. There are four sections. First, create a new deck, in the usual card order (Clubs, Diamonds, Hearts, and Spades). Second, shuffle the deck. Third, deal four hands as usual (North, East, South, and West). Finally, sort the deck.

Roll your own routines! Do not used canned functions. This especially includes the sort function and the shuffle function. It's okay to use `rand()` and `srand()`, but nothing else. Use `ctime` to seed your random number generator.

2   Template

You do not have to use this template. But look carefully at `main()` for your requirements.

```cpp
/**************************************
        Name: Cards Exercise
        Author:
        Date:
        Purpose:
        Input:
        Output:
**************************************/

#include <iostream>
#include <cstdlib>
#include <ctime>

using namespace std;

class Card
{
    //impement your class here

};

//these are the function prototypes
void seeDeck(Card[], int);
void shuffleDeck(Card[], int); //okay to use rand() and srand() here
void sortDeck(Card[], int);
void dealCards(Card[], int);

int main()
{

        const int DECKSIZE = 52;
```

```cpp
    Card deck[DECKSIZE];
/***********************************
* Here you should create your deck of 52 cards, in order.
* You might want to try creating an array of anonymous Card objects.
* This code assumes that you will do this, but of course you can do what you like.
*********************************/

    cout << "\n******************\nOpen a new deck of cards \n******************" << endl;
    seeDeck(deck, DECKSIZE);
    cout << "\n******************\nShuffle a new deck of cards\n******************" << endl;
    shuffleDeck(deck, DECKSIZE);
    seeDeck(deck, DECKSIZE);
    cout << "\n******************\nDeal a deck of cards\n******************" << endl;
    dealCards(deck, DECKSIZE);
    cout << "\n******************\nSort a deck of cards\n******************" << endl;
    sortDeck(deck, DECKSIZE);
    seeDeck(deck, DECKSIZE);

    return 0;
}

//implement your functions here
```

3   Output

Your deliverable is a text file that will look similar to this. You should be able to select your output screen, copy it (with Ctl-C), and insert it into the text entry box (Ctl-V).

```
******************
Open a new deck of cards
******************
Two of Clubs    Three of Clubs    Four of Clubs    Five of Clubs    Six of Clubs    Seven of Clubs
    Eight of Clubs    Nine of Clubs    Ten of Clubs    Jack of Clubs    Queen of Clubs    King of Clubs
    Ace of Clubs    Two of Diamonds    Three of Diamonds    Four of Diamonds    Five of Diamonds
    Six of Diamonds    Seven of Diamonds    Eight of Diamonds    Nine of Diamonds    Ten of Diamonds
    Jack of Diamonds    Queen of Diamonds    King of Diamonds    Ace of Diamonds    Two of Hearts
    Three of Hearts    Four of Hearts    Five of Hearts    Six of Hearts    Seven of Hearts
    Eight of Hearts    Nine of Hearts    Ten of Hearts    Jack of Hearts    Queen of Hearts
    King of Hearts    Ace of Hearts    Two of Spades    Three of Spades    Four of Spades
    Five of Spades    Six of Spades    Seven of Spades    Eight of Spades    Nine of Spades
    Ten of Spades    Jack of Spades    Queen of Spades    King of Spades    Ace of Spades


******************
Shuffle a new deck of cards
******************
Queen of Hearts    Two of Spades    Jack of Diamonds    Seven of Spades    Seven of Clubs
    Jack of Clubs    Jack of Hearts    Three of Clubs    Six of Hearts    Nine of Clubs    Ten of Diamonds
    Ten of Hearts    King of Diamonds    Jack of Spades    Ace of Clubs    Eight of Diamonds
    Ace of Diamonds    King of Spades    Two of Diamonds    Four of Hearts    Nine of Diamonds
    Four of Clubs    Three of Diamonds    Five of Clubs    Five of Hearts    Two of Hearts
    Eight of Clubs    Three of Hearts    Nine of Hearts    Eight of Hearts    Ace of Hearts
    Five of Spades    King of Clubs    Queen of Clubs    Queen of Diamonds    Four of Spades
    Seven of Hearts    Four of Diamonds    Six of Spades    Six of Diamonds    Nine of Spades
```

```
    King of Hearts    Six of Clubs    Three of Spades    Ten of Clubs    Ace of Spades    Queen of Spades
    Eight of Spades    Five of Diamonds    Ten of Spades    Seven of Diamonds    Two of Clubs


*******************
Deal a deck of cards
*******************
North
Queen of Hearts    Two of Spades    Jack of Diamonds    Seven of Spades    Seven of Clubs    Jack of Clubs
    Jack of Hearts    Three of Clubs    Six of Hearts    Nine of Clubs    Ten of Diamonds    Ten of Hearts
East
Jack of Spades    Ace of Clubs    Eight of Diamonds    Ace of Diamonds    King of Spades    Two of Diamonds
    Four of Hearts    Nine of Diamonds    Four of Clubs    Three of Diamonds    Five of Clubs    Five of Hear
South
Eight of Clubs    Three of Hearts    Nine of Hearts    Eight of Hearts    Ace of Hearts    Five of Spades
    King of Clubs    Queen of Clubs    Queen of Diamonds    Four of Spades    Seven of Hearts    Four of Diar
West
Six of Diamonds    Nine of Spades    King of Hearts    Six of Clubs    Three of Spades    Ten of Clubs    Ace
    Queen of Spades    Eight of Spades    Five of Diamonds    Ten of Spades    Seven of Diamonds    Two of Cl


*******************
Sort a deck of cards
*******************
Two of Clubs    Three of Clubs    Four of Clubs    Five of Clubs    Six of Clubs    Seven of Clubs
    Eight of Clubs    Nine of Clubs    Ten of Clubs    Jack of Clubs    Queen of Clubs    King of Clubs
    Ace of Clubs    Two of Diamonds    Three of Diamonds    Four of Diamonds    Five of Diamonds
    Six of Diamonds    Seven of Diamonds    Eight of Diamonds    Nine of Diamonds    Ten of Diamonds
    Jack of Diamonds    Queen of Diamonds    King of Diamonds    Ace of Diamonds    Two of Hearts
    Three of Hearts    Four of Hearts    Five of Hearts    Six of Hearts    Seven of Hearts
    Eight of Hearts    Nine of Hearts    Ten of Hearts    Jack of Hearts    Queen of Hearts
    King of Hearts    Ace of Hearts    Two of Spades    Three of Spades    Four of Spades
    Five of Spades    Six of Spades    Seven of Spades    Eight of Spades    Nine of Spades
    Ten of Spades    Jack of Spades    Queen of Spades    King of Spades    Ace of Spades
```