

CSCI 3110 Project 1



Problem: Your program will implement the preparation routines used in a card game played among four players. First, the program shuffles a deck of cards, then it deals the cards to each of the four players, one at a time in clockwise rotation. After all cards are dealt to the players, the program organizes the cards in each player's hand by sorting their cards by suit. Then the program will display each player's cards.

In this project, you are required to define a class called "CardClass". The 2 data members of this class are:

- the deck of cards implemented in terms of an array of CardStruct of size 52,
- the count of how many cards are remaining in the deck.

Each card is described by its suit, value, and points in game. Define a structured data type **CardType** with following components: suit (CardSuitType), value (int), and points (int). For suit, create an enumeration type called "CardSuitType" that has the four values: DIAMOND, CLUB, HEART, SPADE.

The class should include at least the following member functions:

- **Default constructor** which creates the deck of cards as the following:
 - The deck of cards should be represented as an array of **CardType**. The size of the array is 52. Each card is described by its suit, value, and points in game.
 - A card value is the face value of the card which is from 2 to 14, i.e., 11 for Jack, 12 for Queen, 13 for King, and 14 for Ace.
 - For card points in game, all the cards of HEART suit have points: each HEARTS card of less than 10 face value has 5 points; HERATS of 10, Jack, Queen, King and Ace have 10 points. All Spade, Diamond, and Club cards have a value 0, except that the Queen of Spade has a point of 100, Jack of Diamond has a point of -100.
- **ShuffleCard** which randomizes the 52 cards in the deck
- **DealCard** which deals out, i.e., returns, one card when the function is called. The card dealt out should be from the top of the deck. It should also decrement the number of cards remaining in deck by 1.
- **GetSize** which returns the number of cards currently in the deck
- **IsEmpty** which returns whether or not the deck is empty, e.g., no cards remaining

After you have defined the "CardClass", write a client program that :

- creates an object of CardClass;
- deals cards to 4 players (Each player is defined as a 1-D array of CardStruct type)

- Write a **user defined function SortCards** to sort one player's cards by suit, and optionally, sort by value within each suit.
- Write a **user defined function PrintCards** to display the cards in one player's hand. The card suit, value and points in game for each card are displayed. Output should be nicely formatted. Print suit and value with meaningful name not numbers.
- Display which player has 2 of Club. This player will later start the first round of the game.

Make sure to include detailed description (description, pre-condition, post-condition) of each method in the class in the header file.

Notes:

- Put the definition of "CardStruct" in CardClass.h,
- This is the first part of a larger program. If this part does not work properly, it can affect the next project.

----- Example Output -----

PLAYER 1

SUIT	VALUE	POINTS
Diamond	K	0
Diamond	Q	0
Diamond	J	0
Diamond	9	0
Diamond	7	0
Club	K	0
Club	8	0
Club	4	0
Heart	K	10
Heart	6	5
Heart	2	5
Spade	8	0
Spade	3	0

PLAYER 2

SUIT	VALUE	POINTS
Diamond	8	0
Diamond	6	0
Diamond	4	0
Club	Q	0
Club	7	0
Club	6	0
Club	5	0
Heart	Q	10
Heart	8	5
Heart	A	5

Spade	10	0
Spade	9	0
Spade	A	0

PLAYER 3

SUIT	VALUE	POINTS
Diamond	10	0
Diamond	2	0
Diamond	A	0
Club	J	-100
Club	2	0
Club	A	0
Heart	J	10
Heart	7	5
Spade	Q	100
Spade	J	0
Spade	6	0
Spade	5	0
Spade	4	0

PLAYER 4

SUIT	VALUE	POINTS
Diamond	5	0
Diamond	3	0
Club	10	0
Club	9	0
Club	3	0
Heart	10	10
Heart	9	5
Heart	5	5
Heart	4	5
Heart	3	5
Spade	K	0
Spade	7	0
Spade	2	0

Player 3 has the card 2 of CLUB.