One Card WAR - Prog 2
CECS 325-02 – Spring 2024
Due: 02/27/2024

This assignment will use a Card class to build a Deck class. Then you will use the Deck class to play a card game called **One Card WAR**.
This is a simple game for 2 players. One card is dealt to each player, face up. The highest value card wins. If the cards are the same, then it's a tie. Announce the winner – Game over. You will allow the user to select how many games to play. If the number of requested games is greater that the number of cards in the deck, your Deck class will raise an exception and the main function will catch and resolve the exception. The exception will be raised in the deal() function. Also this program will be in a single file – there will not be separate header and .cpp files for the classes. Also you will use an array to store your cards in the Deck class – NOT a vector

You will have 2 classes:

1) The Deck class which will create the deck of 52 cards
2) The Card class which creates cards

The main logic of the game will be in the main program. You will use the Card class and the Deck class to play the game.

Here are the class descriptions for each class. Use these classes and only these functions.

```
class Deck
      Deck( )            // constructor which creates a deck of 52 cards
      Card deal( )       // deal a card if you can – otherwise raise an exception
      void display( )    // show all the cards in the deck
      void shuffle( )    // shuffle the cards in the deck
      bool isEmpty()     // return true if deck is empty

class Card
      Card ( )                  // default constructor – needed tor array in Deck class
      Card(char , char )        // constructor to create a card, setting the suit and rank
      void display( )           // display the card example: AC, 10S, KD
      int compare(Card)         // return 1 for win, 0 for tie, -1 for lose
```

When you run your program the following will happen in this order:

1) A new deck will be created.
2) The program will ask for the names of the 2 players.
3) The program will ask how many games you want to play. (new for Prog 2)
4) The unshuffled deck will be displayed on the screen.
5) The deck will be shuffled.
6) The shuffled deck will display on the screen.
7) The number of games selected in step 3 will be played, announcing the winner of each game. Ties are possible as well.
8) After all games are played the program will print the statistics.

Things to consider:

- You will raise an exception in the Deck::deal() function to if the deck is empty
- You will catch the exception in the main function
- You need a default Card constructor to declare an array of Cards in the Deck class

- You will combine all files into a single file. The Deck and Card class will be included in the main program. You will not have any #ifndef/#define/#edif statements
- You will us an array to store your cards.

What to submit:

Submit 1 source file: war.cpp.

2 screenshots:

1) The first part of the program which shows the player names and number of games as well as the unshuffled and shuffled deck.
2) The point where the program raised and handled the exception along with the final screen showing the statistics.

Here is a sample of how the game will play out:

First Screenshot

```
Enter the name of the first player: Biden
Enter the name of the second player: Trump
How many games will they play? 2000

 Original Deck
AC,2C,3C,4C,5C,6C,7C,8C,9C,10C,JC,QC,KC
AS,2S,3S,4S,5S,6S,7S,8S,9S,10S,JS,QS,KS
AD,2D,3D,4D,5D,6D,7D,8D,9D,10D,JD,QD,KD
AH,2H,3H,4H,5H,6H,7H,8H,9H,10H,JH,QH,KH

 Shuffled Deck
8C,KC,AC,5C,5H,KS,5D,KD,QC,2H,10D,4H,10S
2S,8D,2C,6D,3D,AH,2D,4S,9S,QH,4D,JD,7H
6S,10H,7C,7S,JS,JC,3C,6C,4C,6H,QS,5S,10C
9H,KH,AD,8S,8H,3H,AS,9D,QD,7D,3S,9C,JH

Game 1
--------
        Biden=>8C
        Trump=>KC
Trump=> Winner

Game 2
--------
        Biden=>AC
        Trump=>5C
Trump=> Winner

Game 3
--------
        Biden=>5H
        Trump=>KS
Trump=> Winner

Game 4
--------
        Biden=>5D
        Trump=>KD
Trump=> Winner

Game 5
--------
        Biden=>QC
        Trump=>2H
Biden=> Winner

Game 6
--------
        Biden=>10D
        Trump=>4H
Biden=> Winner

Game 7
--------
        Biden=>10S
        Trump=>2S
Biden=> Winner

Game 8
--------
```

```
        Biden=>8D
        Trump=>2C
Biden=> Winner

Game 9
--------
        Biden=>6D
        Trump=>3D
Biden=> Winner

Game 10
--------
        Biden=>AH
        Trump=>2D
Trump=> Winner

Game 11
--------
        Biden=>4S
        Trump=>9S
Trump=> Winner

Game 12
--------
        Biden=>QH
        Trump=>4D
Biden=> Winner

Game 13
--------
        Biden=>JD
        Trump=>7H
Biden=> Winner

Game 14
--------
        Biden=>6S
        Trump=>10H
Trump=> Winner

Game 15
--------
        Biden=>7C
        Trump=>7S
Tie game

Game 16
--------
        Biden=>JS
        Trump=>JC
Tie game

Game 17
--------
        Biden=>3C
        Trump=>6C
Trump=> Winner

Game 18
--------
        Biden=>4C
        Trump=>6H
```

```
Trump=> Winner

Game 19
--------
        Biden=>QS
        Trump=>5S
Biden=> Winner

Game 20
--------
        Biden=>10C
        Trump=>9H
Biden=> Winner

Game 21
--------
        Biden=>KH
        Trump=>AD
Biden=> Winner

Game 22
--------
        Biden=>8S
        Trump=>8H
Tie game

Game 23
--------
        Biden=>3H
        Trump=>AS
Biden=> Winner

Game 24
--------
        Biden=>9D
        Trump=>QD
Trump=> Winner
```

```
Game 25
--------
        Biden=>7D
        Trump=>3S
Biden=> Winner

Game 26
--------
        Biden=>9C
        Trump=>JH
Trump=> Winner
Error - Deck is empty
------Final Stats-------
       Biden vs. Trump
Wins   12        11
Losses 11         12
Ties   3          3
```

Second Screenshot

Objectives:

1) Understand how to create classes
2) Learn how to use vectors and arrays in C++
3) Learn how to use header files and .cpp file as separate files.
4) Learn about preprocessor directives, #include libraries, and “using namespace std”
5) Include classes in main program
6) Introduce the rand() function for shuffling cards
7) Get a random number within a range of numbers
8) Throw, try/catch exception handling
9) Default Constructor