Programming Assignment 3
Card Matching Game
Due: 03/06/2012 – Midnight

Overview

For this project you will not be implementing the entire program. You will be supplied with a program shell that will provide the functional framework for your application. The program shell is available for checkout from the class program repository ("https://calypso.vis.uky.edu/cs215/tags/assignments/spr2012/cs215Pgm3"). In these specifications, you will be given requirements for a set of functions that you will need to implement and add to the shell you are given.

For this project you are being introduced to the concept of Design by Contract. In DbC, specifications are given in terms on INPUTS, OUTPUTS, and SIDE EFFECTS. The INPUTS describe what data the framework will pass to you (i.e. the parameters passed to your functions by the application framework). The OUTPUTS specify the results you will return back (the return value). Hence, this gives us the concept of a contract (I'll give you this, you give me that). SIDE EFFECTS specify additional logic that will needed to be performed by your function that does not affect what is returned to the caller.

As with program 2, you are forced to use the function signatures given in the programming assignment. Unlike program 2, you will not be able to get around this since you are forced to use the supplied framework.

Description

Project 3 will implement a card matching game. The playing cards will be displayed face down in a four by twelve matrix. The player will click on a card and it will be turned face up. The player will then click on a second card and if it matches the first card (same rank and suit) , they will be removed from play. The game is over when all cards are matched. Your project will use a Pinochle deck of 48 cards (two each of 9 through Ace for every suit).

The program will use the `PlayingCard` and `CardDeck` classes that you created as part of a recent assignment. You will most likely need to implement additional member functions in these classes. You will also implement five functions within the cs215pgm3.cpp file.

Specifications

`void getCard(int row, int column, char cardString[])`

INPUT:

A character array for storing the output, the row of the card, the column of the card.

OUTPUT: NONE

SIDE EFFECT:

This function should find the card represented by the row and column passed in the function call and updates the char array that was passed with a character string representing the card. This string should always be 2 characters long followed by a null byte. Example representations of the cards are as follows:

2 of spades = 'S2'
10 of hearts = 'HT'
Jack of diamonds = 'DJ'
Queen of clubs = 'CQ'
Ace of spades = 'SA'
Etc.

`void shuffleCards()`

INPUT:

NONE

OUTPUT:

NONE

SIDE EFFECT:

This function will reorder the Cards in your Deck in a random sequence. There should also be a way for your program to associate the Cards in your Deck with the four by twelve display on the GUI.

`void matchTwoCards(int row1, int column1, int row2, int column2)`

INPUT:

Two sets of row/column pairs that each represent a playing card of the game board.

OUTPUT:

NONE

SIDE EFFECT:

If the two cards indicated are of the same suit and rank, the two locations need to

be marked so that the `isCardMatched(...)` function will return true.

`bool isCardMatched(int row, int column)`

INPUT:
Two integers representing the row and column of the card display.

OUTPUT:
A boolean indicating if the card at the row and column has been matched with its pair.

`bool isGameOver()`

INPUT:
NONE

OUTPUT:
A boolean indicating if all the cards on the game board have been matched. TRUE if all cards are matched and FALSE otherwise.

Submission

You will need to submit the source files that you have created along with your modifications to cs215pgm3.cpp. These files should all be put in a .zip file and upload to the CS Portal.