Project 2

Title

Black Jack

Course

CSC-5

Section

40136

Due Date

February 10, 2019

Author

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1. Game plays and Rules

OBJECT OF THE GAME

Each participant attempts to beat the dealer by getting a count as close to 21 as possible, without going over 21.

CARD VALUES/SCORING

Face cards are 10 and any other card is its pip value. Ace is worth 1 or 11, the system will determine the value base on the highest possible hand that is under or equal to one.

THE PLAY

The player to the left goes first and must decide whether to "stand" (not ask for another card) or "hit" (ask for another card in an attempt to get closer to a count of 21, or even hit 21 exactly). Thus, a player may stand on the two cards originally dealt him, or he may ask the dealer for additional cards, one at a time, until he either decides to stand on the total (if it is 21 or under), or goes "bust" (if it is over 21). In the latter case, the player loses and the dealer collects the bet wagered. The dealer then turns to the next player to his left and serves him in the same manner.

The combination of an ace with a card other than a ten-card is known as a "soft hand," because the player can count the ace as a 1 or 11, and either draw cards or not. For example with a "soft 17" (an ace and a 6), the total is 7 or 17. While a count of 17 is a good hand, the player may wish to draw for a higher total. If the draw creates a bust hand by counting the ace as an 11, the player simply counts the ace as a 1 and continues playing by standing or "hitting" (asking the dealer for additional cards, one at a time).

THE DEALER'S PLAY

When the dealer has served every player, his face-down card is turned up. If the total is 17 or more, he must stand. If the total is 16 or under, he must take a card. He must continue to take cards until the total is 17 or more, at which point the dealer must stand. If the dealer has an ace, and counting it as 11 would bring his total to 17 or more (but not over 21), he must count the ace as 11 and stand. The dealer's decisions, then, are automatic on all plays, whereas the player always has the option of taking one or more cards.

Note*

In this version, both the player and the dealer(computer) is only able to hit once.

```
Welcome to BlackJack!
Beat the dealer by getting a count as close to 21 as possible, without going over 21.

Enter any key to start, if you want to exit the game anytime of the game just enter 'x'
a

Round: 1 | Chip: 100 | Games Won: 0 | Win Percentage: 0%

Place Your bets or enter 'x' to exit. Choose one of the following letter.

a: 10
b: 20
c: 50
d: 100
a

Your bet is: 10

Your Hand:
[Club 3]
[Spade 10]

House's Hand:
[Diamond 10]

Enter 'h' to Hit or 's' to Stand:
h

The dealer has deal another card to your hand:
[Club 5]

The dealer has revealed his cards.
[Heart 10]

-----House win!-----
```

During the game you can see which round you are in, how many chips you have, games won, and win percentage. You can select a,b,c or d to bet 10, 20, 50 or 100 chips. You cannot bet more than you have.

2. Features

```
-----Statistic Menu-----

1. Hand Summary
2. Card Summary
3. Exit Menu
1
-------Hand Summary-----
*Note: 0 means either it was a Black Jack or Bust during that game.
Player's Hand:  20 16  0
House's Hand:   17 17  0
```

The additional Statistic Menu gives you two different analysis.

- The Hand Summary will give you all the hands that is played in previous games, but if there is a Black Jack or Bust on either the player or the house, it will appear to be zero.

```
-----Statistic Menu-----

1. Hand Summary
2. Card Summary
3. Exit Menu
2
-------Card Summary-----
Suit    A 2 3 4 5 6 7 8 9 T J Q K
Heart   0 0 0 0 0 0 1 1 0 0 0 0 0
Diamond 0 0 0 0 0 1 0 0 0 0 0 0 0
Club    1 0 0 0 1 0 0 0 1 0 0 0 0
Spade   0 0 0 0 0 0 0 0 0 0 0 0 0
```

- . The Card Summary will show how many times a card has shown up in previous games.

3. Pseudo Code

```
/*
 * File:   main.cpp
 * Author: Harrison Chen
 * Created on February 09, 2019, 10:30 PM
 * Purpose: Project 1 Blackjack V8
 */

//System Libraries
//Input/Output Library
//String Library
//C standard Library
//time library for random
//vector library
//Output formatting
//namespace standard

// User Libraries

// Global Constants, no global variables are allowed
// Math/Physics/Conversions/ Higher Dimensions - i.e, PI, e, etc...

//constant
//Column number for 2d array
//Row number for 2d array

//Create vector for card with rank, suit and value
   //stores the rank of the card
   //stores the suit of the card
   //stores the value of the card
```

```
// Function Prototypes
//Function that creates card and place into deck
// Function to Deal a Card and remove a card from deck
//Function that show the player's hand
//Function that show the house's hand
//Function that Checks for Blackjack
//Function that check if the sum of the cards are over 21
//Function that will compare the player's and the house's hand
//Function that will determine if the house will hit or stand
//Function that clears the hand
//Function that determines how many chips the player bets
//Function that calculates the payout
//Function for stats Menu
//Function for adding cards to 2d array
//Function to initialize 2d array

// Execution Begins Here:

    // Set random number seed

    // Declare Variables
    //variable for input
    //random generated number
    //number of deck that is used in a game
    // 0 = player gets 1.5X payout, 1 = player gets 1X payout, 2 = player lost, 3 = draw
    //Number of chips a player has
    //Number of Games played
    //Number of Games Won
    //Players bet
    //Winning percentage
    // Using two deck of cards to play
    // Starting with 100 chips
    // setting game count to 0
    //setting win count to 0
    //setting win percentage to 0
    // Creating vector to store all the cards
    // Vector to hold the player's hand
    //Vector to hold the house's hand
    //player hand Array
    //House hand Array
    // Total cards Array - 2D
```

```
//Start Game
// create the deck with the vector and number of deck you want
// Initializing the total card array with 0's
// Welcome prompt

// waiting for input
// game loop will exit if input is x
    //display game stats

    // waiting for use to input bet selection
    //if user enter x then break the current loop
    //if invalid input breaks the loop
    // if user enter i call stats Menu function
    //display stat menu
    //breaks the loop after quitting the stats menu
    //bet is placed

    //Deals two initial cards to player

    //Deals one initial cards to house


    //Display all the cards


    //Game logic starts
    //Check if player has BJ
        //result of 1.5X payout
    //Declare a boolean for endGame flag

            //Asking player to hit or stand

                //If player choose hit
                    //Deal another card to player
                    //Display player's hand
                    //Check if sum of player's hand is over 21
                        // will end the game loop

                //If player choose stand
                    //Deal second card to house's hand
```

```
                //Display house's hand
                //Check if house has BJ

                    //if house does not have BJ
                    //Check if house need to hit
                        //Deals another card to house
                        //Display house's hand
                        //add one the win count

                        //Compared the player's hand against the house's hand

                            //Player's hand > house's hand

                            //House's hand > player's hand

                            //Tie

                    //End game logic loop
                //press x to exit
                    //End game logic loop
                //invalid input, try again

            //if endGm = true then the game logic loops end
            //Add cards to 2d array
            //clear player's hand
            //clear house's hand

        // determine the payout of game
        // Game over when funds are insufficient

        //add one to game count
        //Calculate the wining percentage

    // Exit stage right or left!

//Function that creates card and place into deck
        //rank Names
        // Loop for creating suits, rank, and value


// Function to Deal a Card and remove a card from deck
    //added the cards chosen to the hand
    //erase the card from the deck
```

```
//Function that show the player's hand
    //loop thru all hand
    //display the card

//Function that show the house's hand
    //loop thru all hand
    //display the card


//Function that Checks for Blackjack
    //check if ace is present
    //sum of all the cards
    //check if the sum is 11 and there is a ace
        //BJ
        //Not BJ


//Function that check if the sum of the cards are over 21
    //loop thru all cards
    //sum of all the cards
    //check if sum is over

//Function that will compare the player's and the house's hand
    //loop thru player's hand
        //sum all cards
    //loop thru house's hand
        //sum all cards
    //compare hands

//Function that will determine if the house will hit or stand
    //loop thru house's hand
        //sum all cards up
    //if larger than 17
        //stand
    //else
        //hit

//Function that clears the hand
    //erase the vector

//Function that determines how many chips the player bets
```

```
    // switch for a b c d

//Function that calculates the payout
    //switch for 4 playout

//Functions for stats Menu
    //switch for stats menu
        //loop thru both array for sum of hands
        //loop thru 2d array to display number of cards

//Function for adding cards to 2d array
    //loop thru the hands
    //find each cards and add it to 2d array

//Function to initialize 2d array with 0's
    //loop thru array
        // initialize with 0
```