Project 1

Blackjack Program

CSC-5

Section 46023

Summer 2014

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Introduction: Blackjack

The program presented here begins by prompting the user to select between playing Blackjack, reading the rules of Blackjack, or exiting the program altogether. The first option immediately allows the user to begin playing the game. The second option goes over a brief description of the game and the ways in which it is possible to win, lose, and draw, as well as the value of the cards. The third options exits the programs and discontinues the game.

Blackjack is a comparing card game between a player and dealer.The object of the game is to beat the dealer, which can be done in a number of ways:

1) Get 21 points on the player's first two cards. This is called a blackjack.
2) Reach a final score higher than the dealer without exceeding 21.
3) Let the dealer draw additional cards until his or her hand exceeds 21.

The player or players are dealt an initial two-card hand and add together the value of their cards. Face cards (kings, queens, and jacks) are counted as ten points. A player and the dealer can count his or her own ace as 1 point or 11 points, depending on the player's total. All other cards are counted as the numeric value shown on the card. After receiving their initial two cards, players have the option of getting a "hit," or taking an additional card. Scoring higher than 21 (called "busting") results in a loss. A player may win by having any final score equal to or less than 21 if the dealer busts.

Development Summary

Before I decided to write this program, I had actually already written up a turn-based Pokemon battle that I planned on submitting as my project. However, I didn't think that the program showcased all of the ideas that we had learned up to this point in the course, so I decided to try and write this Blackjack program instead. Admittedly, I had never played Blackjack before, but my Grandma happens to manage several casinos in Las Vegas, so even though I could have easily Googled how to play Blackjack, he was able to help me understand the basic jist of the game. While it's easy to understand, the logic behind programming it took a while. Before we had covered functions during lecture, I found it difficult to implement the carding dealing without calling on functions. Even after lecture, I continued to read my *Problem Solving with C++ 8th Edition by Walter Savitch* textbook and read various forums on sites like (http://cpluspluscom) for more clarification and insight into ways to utilize functions. When I first began writing the code, I tried to do so by directly typing it into NetBeans. A couple days after I began, I realized that it was a jumbled mess and instead took a different approach that included flowcharting it out by hand first. I thought flowcharts were a little unnecessary before this project, and now I definitely see how useful they can be. It still took many revisions to get the program to run the way I wanted it to, but I'm finally satisfied with the program.

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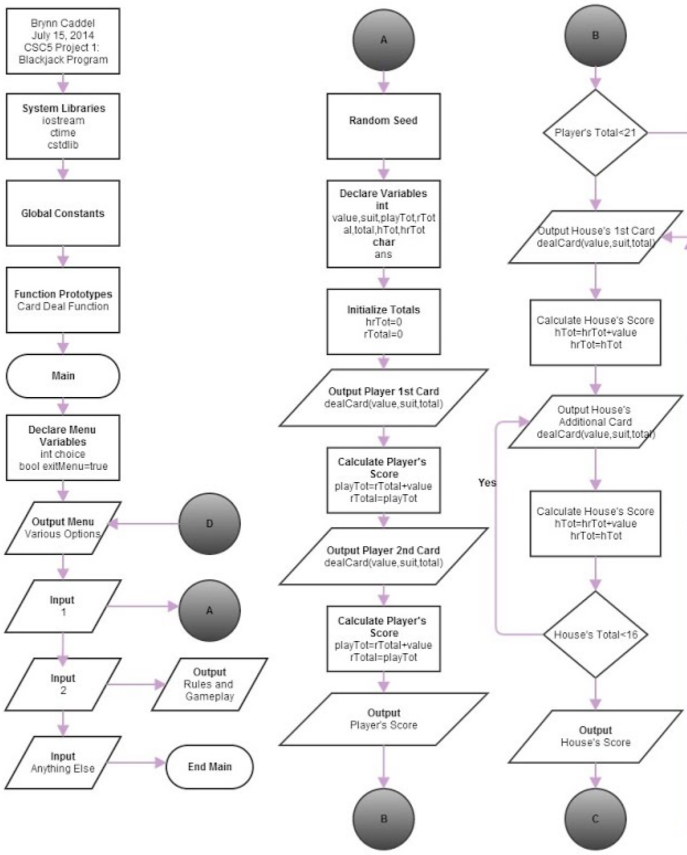

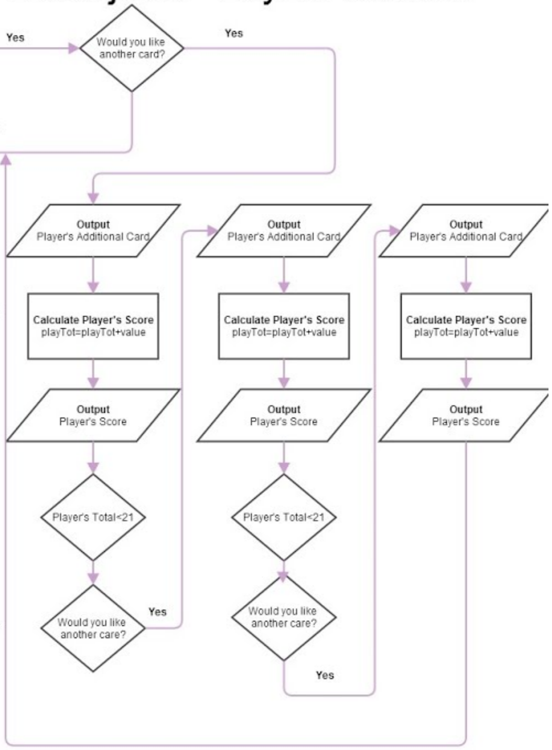

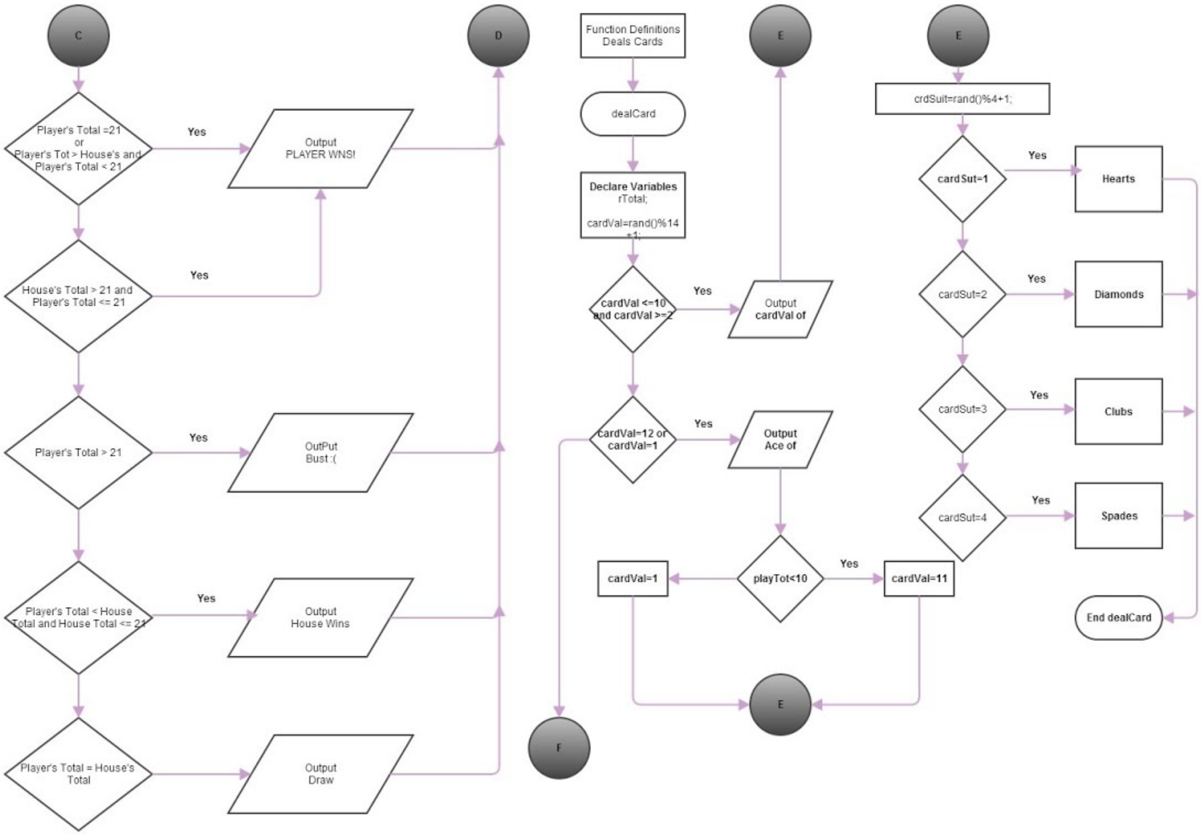

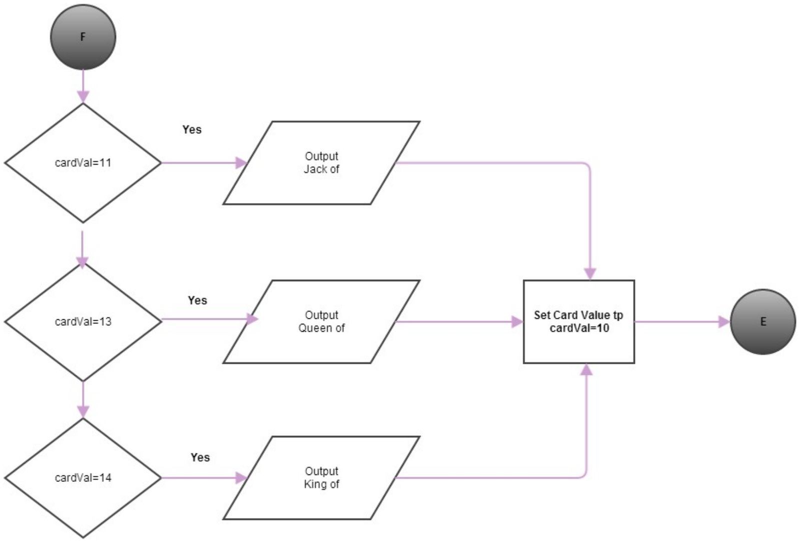
F
cardVal=11
Yes
Output
Jack of
cardVal=13
Yes
Output
Queen of
Set Card Value tp
cardVal=10
E
cardVal=14
Yes
Output
King of

Variables Used:

Type	Variable Name	Purpose
Integer	value	Holds the dealt card value
	suit	Holds the suit of the card
	playTot	Holds the player’s score
	runTotal	Used to keep a running total of the player’s score
	total	Used to hold the value of a card
	hTotal	Holds the house’s total score
	hrTotal	Used to keep a running total of the house’s score
	cardVal	Holds the card value within the function
	crdSuit	Holds the card value within the function
	choice	User input selection
Character	answer	Used to allow the player to continue the game
Boolean	exitMenu	Used in Case 3 to end the program

Concepts Used:

Textbook Used: Problem Solving with C++ 8th Editions by Walter Savitch

2.1	Variables and Assignments
2.2	Input and Output
2.3	Data Types and Expression
2.4	Simple Flow Control
2.5	Program Style
3.1	Using Boolean Expressions
3.2	Multiway Branches
3.3	More About C++ Loop Statements
3.4	Designing Loops
4.1	Top-Down Design
4.2	Predefined Functions
4.3	Programmer-Defined Functions
4.4	Procedural Abstraction
4.5	Scope and Local Variables
5.1	Void Functions
5.2	Call-By-Reference Parameters

Other Sources of Information:

Functions: http://www.cplusplus.com/doc/tutorial/functions/
Boolean Expressions: http://www.cplusplus.com/forum/beginner/15438/
Boolean Operators: http://www.cplusplus.com/doc/tutorial/operators/
Void Functions: http://www.cplusplus.com/forum/beginner/113032/
Call-By-Reference Parameter: http://www.cplusplus.com/forum/general/7990/
Flow Control/Loops: http://www.cplusplus.com/doc/tutorial/control/

```
/*
 * File:   main.cpp
 * Author: Brynn Caddel
 * Created on July 13, 2014, 6:51 PM
 * Purpose: Project 1: Blackjack Program - CSC5 46023
 */

//System Libraries
#include <cstdlib>      //Random Function Srand
#include <iostream>     //Standard Input and Output
#include <ctime>        //Time for Random
using namespace std;
//Global Constants

//Global Variables (just kidding.....)

//Function Prototypes
void dealCrd(int& cardVal, int& crdSuit, int& playTot);

//Execution Begins Here
int main(int argc, char** argv) {
    //Declare Variables: Menu
    int choice;                 //Menu Selection Input
    bool exitMenu=true;         //Option to end the program at menu selection
    //Loop: Implemented Until Exit
    do{
        //Output Menu
        cout<<"Select From The Menu"<<endl;
        cout<<"1. Play Blackjack!"<<endl;
        cout<<"2. Rules and Gameplay"<<endl;
        cout<<"3. Press Anything Else to Exit"<<endl;
        cout<<"\n";
        //User Selection Input
        cout<<"Selection: ";
        cin>>choice;
        //Beginning of Case 1: Play Blackjack
        switch(choice){
            case 1:
                //Set Random Seed
                srand(static_cast<unsigned int> (time(0)));
                //Variable Declaration
                int value;              //Holds the dealt card value
                int suit;               //Holds the suit of the card dealt
                int playTot;            //Player's Score
                int runTotal;           //Used to keep a running total the player's score
                int total;              //Card value total
                int hTotal;             //The House's total score
                int hrTotal;            //Used to keep a running total of the house's score
                char answer;            //User's Answer
                //Variable Initialization
```

```
hrTotal = 0;
runTotal=0;
//Begin Player's First Hand
cout << "You have been dealt the following cards: ";
dealCrd(value, suit, total);
playTot = runTotal + value;
runTotal = playTot;
cout << " // ";
dealCrd(value, suit, total);
playTot = runTotal + value;
cout << "\n";
cout << "Your score is: ";
cout << playTot;
//Decision: Allows the Player to Hit/Continue to Play
if (playTot < 21) {
    cout <<"\n";
    cout << "Would you like another card?\n";
    cout<<"\n";
    cout << "Enter Y for Yes. Enter N for No: ";
    cin>>answer;
    if (answer == 'y' || answer == 'Y') {
        //Player's Additional Cards
        cout << "\n";
        cout << "You have been dealt a ";
        dealCrd(value, suit, total);
        playTot = playTot + value;
        cout<<"\n";
        cout << "Your score is now: ";
        cout << playTot;
        cout << "\n\n";
        if (playTot < 21) {
            cout << "Would you like another card?\n";
            cout << "Enter y for yes, anything else for no: ";
            cin>>answer;
            if (answer == 'y' || answer == 'Y') {
                //Player's Additional Card
                cout << "You have been dealt a ";
                dealCrd(value, suit, total);
                playTot = playTot + value;
                cout<<"\n";
                cout << "Your score is now: ";
                cout << playTot;
                cout << "\n\n";
                if (playTot < 21) {
                    cout << "Would you like another card?\n";
                    cout << "Enter y for yes, anything else for no: ";
                    cin>>answer;
                    if (answer == 'y' || answer == 'Y') {
                        //Player's Additional Card
                        cout << "You have been dealt a ";
```

```
                 dealCrd(value, suit, total);
                 playTot = playTot + value;
                 cout<<"\n";
                 cout << "Your score is now: ";
                 cout << playTot;
                 cout << "\n\n";
                }
             }
          }
       }
    }else;
}
//End Player's Hand
//Begin House's First Hand
cout<<"The house has been dealt the following cards: ";
dealCrd(value, suit, total);
hTotal=hrTotal+value;
hrTotal=hTotal;
do{
cout<<" // ";
dealCrd(value, suit, total);
hTotal=hrTotal+value;
hrTotal=hTotal;
//House Continues to Deal Cards if score < 16
}while(hTotal<16);
cout<<"\n";
cout<<"The house's score is: ";
cout<<hTotal;
cout<<"\n";
//Outcome Output
if(playTot==21||(playTot>hTotal&&playTot<21)){
    cout<<"\n";
    cout<<"Yay! You have won the game!";
    cout<<"\n";
    cout<<"\n";
}else if(hTotal>21&&playTot<=21) {
    cout<<"\n";
    cout<<"Yay! You have won the game!";
    cout<<"\n";
    cout<<"\n";
}else if(playTot>21){
    cout<<"\n";
    cout<<"Bust :(";
    cout<<"\n";
    cout<<"\n";
}else if(playTot<hTotal&&hTotal<=21){
   cout<<"\n";
    cout<<"Sorry, you lose. The House Wins! The House always wins.......";
    cout<<"\n";
}else if(playTot==hTotal){
```

```
                          cout<<"\n";
                          cout<<"Draw! Play Again!";
                      }
                       // END of Case 1
                       // Start of Case 2
                               break;
                               case 2:
                               cout<<"\n";
                               cout<<"Blackjack is a comparing card game between a player and dealer."<<endl;
                               cout<<"The object of the game is to beat the dealer, which can be "<<endl;
                               cout<<"done in a number of ways:"<<endl;
                               cout<<"1) Get 21 points on the player's first two cards. This is called a blackjack."<<endl;
                               cout<<"2) Reach a final score higher than the dealer without exceeding 21.          "<<endl;
                               cout<<"3) Let the dealer draw additional cards until his or her hand exceeds 21. "<<endl;
                               cout<<"The player or players are dealt an initial two-card hand and add together the"<<endl;
                               cout<<"value of their cards. Face cards (kings, queens, and jacks) are counted as "<<endl;
                               cout<<"ten points. A player and the dealer can count his or her own ace as 1 point "<<endl;
                               cout<<"or 11 points, depending on the player's total. All other cards are counted as"<<endl;
                               cout<<"the numeric value shown on the card.                                         "<<endl;
                               cout<<"After receiving their initial two cards, players have the option of getting a"<<endl;
                               cout<<"'hit', or taking an additional card. Scoring higher than 21 (called 'busting'"<<endl;
                               cout<<"or 'going bust') results in a loss. A player may win by having any final     "<<endl;
                               cout<<"score equal to or less than 21 if the dealer busts.                          "<<endl;
                               cout<<"The dealer has to take hits until his or her cards total 17 or more points. "<<endl;
                               cout<<"\n";
                               ;break;
                               default: exitMenu=false;
                           } //END of Case 2
                       //If the user picks anything other than 1 or 2, the program exits.
                       }while(exitMenu);
                       // QED
    return 0;
}
//Definitions for the Card Dealing Function
void dealCrd(int& cardVal, int& crdSuit, int& playTot){
    //Function: Randomly Selects Card Value
    int runTotal;
    cardVal=rand()%14+1;
    if (cardVal<=10&&cardVal>=2){
        cout<<cardVal;
        cout<<" of ";
    }if (cardVal==11){
        cout<<"Jack of ";
        cardVal=10;
    }if (cardVal==12||cardVal==1){
        cout<<"Ace of ";
        if (playTot<10){
            cardVal=11;
        }else
            cardVal=1;
    }if (cardVal==13){
        cout<<"Queen of ";
        cardVal=10;
            }if (cardVal==14){
        cout<<"King of ";
        cardVal=10;
    }
   //End Function Definition of Card Value Selection
   //Function: Randomly Selects Card's Suit
   crdSuit=rand()%4+1;
   if(crdSuit==1){
       cout<<"Hearts";
   }if(crdSuit==2){
       cout<<"Diamonds";
   }if(crdSuit==3){
       cout<<"Clubs";
   }if (crdSuit==4){
       cout<<"Spades";
   }
   //End Function Definition of Card Suit
}
```