**Roulette**

Project 1

CSC-5 Intro C++

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**1 - Introduction**

**Rules and Gameplay:**

Roulette is a common casino game. In the game, players will have a menu to let them decide how they would like to place the bet. If they want to bet on a number in between 1 and 36, they will be paid 36 times their bet if they win. If they want to bet on a color—either black or red, or if they want to bet whether the number will be even or odd, they will be paid twice as much as the bet if they win. Other than those options, they can also choose to bet on a dozen of number sorted by range, and if they win, they will be paid 3 times as much as their bet.

**Description**

I will not even try to make myself sound like the best kid in the world – once I turned 18, I went to Morongo Casino to “take a look” because that is the only casino that will allow 18+ to gamble legally. Roulette was one of the first games I played and it still is my favorite game.

In real life gambling, the players are also allowed to do multiple bets. For instance, a player could bet on number 23, even, high, and red or he or she could even bet on “0” or “00”. However, in this program, I did not make it as complicated – I only allow player to choose one option to bet on. I mainly focus on using the knowledge that I learned in the first half of the course.

**2 - Development**

**Approached Strategy:**

It took me a few days to come up with the structure of this program. The first thing that came into my mind was the options I would provide the user, which brought in the idea of switch cases. After the user picks an option to play with, the program will then prompt the user to answer a series of questions. According to the answers to the questions, the program will first validate the input. The program will not let the user play this game until the input is valid.

**Input Validation:**

I did not think that I would write a program myself that includes so much validation. I did not realize how much I need it until I ran my program several times in front of different people including a person that does not have a single clue how computer programming works. Like Dr. Lehr mentioned in class, the users are the dumb ones vs. we programmers are the smart ones, however, the dumb can easily break the smart’s code without even trying. Yes, now I know how important input validation is. I used a very simple logic for all the validations throughout the code which I actually like a lot, for example:

do{

invalid=false;

cout << "Which number would you like to bet from 1-36?" << endl;

cin >> numBet; //Get user input

if(numBet<1 || numBet>36){

invalid=true;

}

if(invalid==true){

cout << "Invalid Entry." << endl;

}

}while(invalid==true);

**Research:**

Rather than calling it research, I would say I brought in one concept that was not covered until very recent which is also not required for this project – function. The one void function that I used helped me shorten the code quite a bit.

//Function Prototypes

void question(float &bank, float &bet, bool &invalid);

**3 - Pseudo Code**

*This is a program of Roulette*

*Introduction of the game rules*

*Declare Variables*

*Type of bet chosen by the player*

*How many times the player wants it to spin*

*The number bet*

*The actual number off the spins*

*The player bet on even or odd number*

*The color that gives off by the spin*

*The color of the number bet*

*The range of the number bet*

*The original total that the player has*

*The amount bet*

*The amount the player have after game*

*If the player wants to play again*

*For validation purpose*

*Set the random number seed*

*Would you like to play again/Input Validation*

*Spin the wheel for times defined by user*

*Menu*

*Input validation for menu*

*Determine the random*

*Start of switch case*

*Case A*

*Use function*

*Get user input*

*Input Validation*

*Output the result*

*Calculation for win*

*Calculation for lose*

*Case B*

*Use function*

*Get user input*

*Input Validation*

*Determine a random color 1=black, 0=red*

*Output the result*

*Calculation for win*

*Calculation for lose*

*Case C*

*Use function*

*Get user input*

*Input Validation*

*Output the result*

*Calculation for win*

*Calculation for lose*

*Case D*

*Use function*

*Get user input*

*Input Validation*

*Output the result*

*Calculation for win*

*Calculation for lose*

*End of switch case*

*End of for loop*

*End of do-while loop*

**4 – Flowchart**

**5 - Code**

*/\**

*\* File: Project 1 Roulette*

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*\* Created on July 14, 2014, 1:13 PM*

*\*/*

*//System Level Libraries*

**#include <cstdlib>**

**#include <iostream>**

**#include <cmath>**

**#include <iomanip>**

**#include <string>**

**using** **namespace** std;

*//User Defined Libraries*

*//Global Constants*

*//Function Prototypes*

**void** **question**(**float** **&**bank, **float** **&**bet, **bool** **&**invalid);

*//Execution Begins Here!*

**int** **main**(**int** argc, **char\*\*** argv) {

*//This is a program of Roulette*

*//Introduction of the game rules*

cout **<<** "Roulette is a casino game named after a French " **<<** endl;

cout **<<** "diminutive for little wheel. " **<<** endl;

cout **<<** "This program is a simplified roulette game." **<<** endl;

*//Declare Variables*

**char** type; *//Type of bet chosen by the player*

**unsigned** **short** spin; *//How many times the player wants it to spin*

**unsigned** **short** numBet; *//The number bet*

**unsigned** **short** num; *//The actual number off the spins*

string choice; *//The player bet on even or odd number*

**bool** co; *//The color that gives off by the spin*

string color; *//The color of the number bet*

string range; *//The range of the number bet*

**float** bank; *//The original total that the player has*

**float** bet; *//The amount bet*

**float** amnt; *//The amount the player have after game*

**char** again; *//If the player wants to play again*

**bool** invalid; *//For validation purpose*

*//Set the random number seed*

srand(**static\_cast<unsigned** **short>**(time(0)));

**do**{ *//Would you like to play again/Input Validation*

    cout **<<** "How many times would you like to spin?" **<<** endl;

    cin **>>** spin;

**for**(**int** i**=**1; i**<=**spin; i**++**){ *//Spin the wheel for times defined by user*

**do**{

            invalid**=**false;

*//Menu*

            cout **<<** "Type A if you want to bet on a number. " **<<** endl;

            cout **<<** "Type B if you want to bet on a colors red or black." **<<** endl;

            cout **<<** "Type C if you want to bet whether the number is odd or even." **<<**endl;

            cout **<<** "Type D if you want to bet on a dozen of numbers by ranging."**<<** endl;

            cin **>>** type;

*//Determine the random number*

            num**=**rand()**%**36**+**1;

**switch**(type){

**case** 'A'**:**

**case** 'a'**:**{

                    question(bank, bet, invalid);

**do**{

                        invalid**=**false;

                        cout **<<** "Which number would you like to bet from 1-36?" **<<** endl;

                        cin **>>** numBet; *//Get user input*

**if**(numBet**<**1 **||** numBet**>**36){ *//Input Validation*

                            invalid**=**true;

                        }

**if**(invalid**==**true){

                            cout **<<** "Invalid Entry." **<<** endl;

                        }

                    }**while**(invalid**==**true);

*//Output the result*

                    cout **<<** setw(8) **<<** "Number" **<<** setw(15) **<<** "Your Pick" **<<** endl;

                    cout **<<** "----------------------------" **<<** endl;

                    cout **<<** setw(6) **<<** num **<<** setw(12) **<<** numBet **<<** endl;

                    cout **<<** fixed **<<** showpoint **<<** setprecision(2) **<<** endl;

**if**(numBet **==** num){

                        amnt **=** bank **-** bet **+** bet **\*** 36; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 36 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt **<<** endl **<<** endl;

                    }

**else**{

                        amnt **=** bank **-** bet; *//Calculation*

                        cout **<<** "Sorry, you lost $" **<<** bet **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt **<<** endl;

                        cout **<<** "Good luck on your next spin!" **<<** endl **<<** endl;

                    }

**break**;

                }

**case** 'B'**:**

**case** 'b'**:**{

                    question(bank, bet, invalid);

**do**{

                        invalid**=**false;

                        cout **<<** "Would you like to bet on black(B) or red(R)?" **<<** endl;

                        cin **>>** color; *//Get user input*

**if**(color.length()**!=**1){ *//Input Validation*

                            invalid**=**true;

                        }

**if**(color[0]**!=** 'r' **&&** color[0]**!=** 'R' **&&** color[0]**!=** 'b' **&&** color[0]**!=** 'B'){

                            invalid**=**true;

                        }

**if**(invalid**==**true){

                            cout **<<** "Invalid Entry" **<<** endl;

                        }

                    }**while**(invalid **==** true);

*//Determine a random color 1=black, 0=red*

                    co**=**rand()**%**2;

*//Output the result*

                    cout **<<** setw(8) **<<** "Color" **<<** setw(15) **<<** "Your Pick" **<<** endl;

                    cout **<<** "----------------------------" **<<** endl;

**if**(co**==**0){

                        cout **<<** setw(6) **<<** "red" **<<** setw(12) **<<** color **<<** endl;

                    }

**else**{

                        cout **<<** setw(6) **<<** "black" **<<** setw(12) **<<** color **<<** endl;

                    }

                    cout **<<** fixed **<<** showpoint **<<** setprecision(2) **<<** endl;

**if**((color[0]**==**'b' **||** color[0] **==**'B') **&&** co**==**1){

                        amnt **=** bank **-** bet **+** bet **\*** 2; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 2 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl;

                    }

**else** **if**((color[0]**==**'r' **||** color[0] **==**'R') **&&** co**==**0){

                        amnt **=** bank **-** bet **+** bet **\*** 2; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 2 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl;

                    }

**else**{

                        cout **<<** "Sorry, you lost $" **<<** bet **<<** endl;

                        cout **<<** "Now you have $" **<<** bank **-** bet **<<** endl;

                        cout **<<** "Good luck on your next spin!" **<<** endl **<<** endl;

                    }

**break**;

                }

**case** 'C'**:**

**case** 'c'**:** {

                    question(bank, bet, invalid);

**do**{

                        invalid**=**false;

                    cout **<<** "Would you like to place your bet on E(even) "

                            "or O(odd)?" **<<** endl;

                    cin **>>** choice; *//Get user input*

**if**(choice.length()**!=**1){ *//Input Validation*

                        invalid**=**true;

                    }

**if**(choice[0]**!=**'E' **&&** choice[0]**!=**'e' **&&** choice[0]**!=** 'O' **&&** choice[0]**!=**'o'){

                        invalid**=**true;

                    }

**if**(invalid**==**true){

                        cout **<<** "Invalid Entry" **<<** endl;

                    }

                    }**while**(invalid**==**true);

*//Output the result*

                    cout **<<** setw(8) **<<** "Number" **<<** setw(15) **<<** "Your Pick" **<<** endl;

                    cout **<<** "----------------------------" **<<** endl;

                    cout **<<** setw(6) **<<** num **<<** setw(12) **<<** choice **<<** endl;

                    cout **<<** fixed **<<** showpoint **<<** setprecision(2) **<<** endl;

**if**(num**%**2**==**0 **&&** (choice[0]**==**'E'**||**choice[0]**==** 'e')){

                        amnt **=** bank **-** bet **+** bet **\*** 2; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 2 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl;

                    }

**else** **if**(num**%**2**==**1 **&&** (choice[0]**==**'O'**||**choice[0]**==**'o')){

                        amnt **=** bank **-** bet **+** bet **\*** 2; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 2 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl **<<** endl;

                    }

**else**{

                        cout **<<** "Sorry, you lost $" **<<** bet **<<** endl;

                        cout **<<** "Now you have $" **<<** bank **-** bet **<<** endl;

                        cout **<<** "Good luck on your next spin!" **<<** endl **<<** endl;

                    }

**break**;

            }

**case** 'D'**:**

**case** 'd'**:**{

                    question(bank, bet, invalid);

**do**{

                        invalid**=**false;

                        cout **<<** "Which dozen of number would you like to bet on?" **<<** endl;

                        cout **<<** "1:1-12; 2:13-24; 3: 25-36" **<<** endl;

                        cin **>>** range; *//Get user input*

**if**(range.length()**!=**1){ *//Input Validation*

                            invalid**=**true;

                        }

**if**(range[0]**<**'1' **||** range[0]**>**'3' ){

                            invalid**=**true;

                        }

**if**(invalid**==**true){

                            cout **<<** "Invalid Entry" **<<** endl;

                        }

                    }**while**(invalid **==** true);

*//Output the result*

                    cout **<<** setw(8) **<<** "Number" **<<** setw(15) **<<** "Your Pick" **<<** endl;

                    cout **<<** "----------------------------" **<<** endl;

                    cout **<<** setw(6) **<<** num **<<** setw(12) **<<** range **<<** endl;

                    cout **<<** fixed **<<** showpoint **<<** setprecision(2) **<<** endl;

**if**((num**>=**1 **&&** num**<=**12) **&&** range[0]**==**'1'){

                        amnt **=** bank **-** bet **+** bet **\*** 3; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 3 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl **<<** endl;

                    }

**else** **if**((num**>=**13 **&&** num**<=**24) **&&** range[0]**==**'2'){

                        amnt **=** bank **-** bet **+** bet **\*** 3; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 3 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl **<<** endl;

                    }

**else** **if**((num**>=**25 **&&** num**<=**36) **&&** range[0]**==**'3'){

                        amnt **=** bank **-** bet **+** bet **\*** 3; *//Calculation*

                        cout **<<** "Congratulations! You won $" **<<** bet **\*** 3 **<<** endl;

                        cout **<<** "Now you have $" **<<** amnt**<<** endl **<<** endl;

                    }

**else**{

                        cout **<<** "Sorry, you lost $" **<<** bet **<<** endl;

                        cout **<<** "Now you have $" **<<** bank **-** bet **<<** endl;

                        cout **<<** "Good luck on your next spin!" **<<** endl **<<** endl;

                    }

**break**;

                }

**default:**

                    cout **<<** "Please choose from A, B, C and D." **<<** endl **<<** endl;

                    invalid**=**true;

            } *// The end of switch case*

        }**while**(invalid**==**true); *// The end of do-while loop/ Input Validation for menu*

    }*//The end of for loop*

        cout **<<** "Would you like to play again? Type Y for yes "

            "or any other letter for no." **<<** endl;

        cin **>>** again;

}**while**(again**==**'Y' **||** again**==**'y'); *//End of do-while loop*

**return** 0;

}

**void** **question**(**float** **&**bank, **float** **&**bet, **bool** **&**invalid){

**do**{

   invalid**=**false;

   cout **<<** "How much total do you have? " **<<** endl;

   cin **>>** bank;

**if**(bank**<=**0){

       invalid**=**true;

   }

**if**(invalid**==**true){

       cout **<<** "Invalid Entry. You need to have minimum 1 penny." **<<** endl;

    }

}**while**(invalid**==**true);

**do**{

    invalid**=**false;

    cout **<<** "How much would you like to bet?" **<<** endl;

    cin **>>** bet;

**if**(bet**<=**0 **||** bet**>**bank){

        invalid**=**true;

    }

**if**(invalid**==**true){

        cout **<<** "Invalid Entry. You need to bet minimum 1 penny or " **<<** endl;

        cout **<<** "you cannot bet more than $" **<<** bank **<<** endl;

    }

}**while**(invalid**==**true);

}