**CSCI 1470 – Fall 2015  
Lab 9 Assignment**

**Due Date: Monday November 2, 11:00PM**

**Topic:** Functions (***Pass by Value, Pass by Reference***)   
**Reading:** Chapter 6.

Submit all source codes (\*.cpp) at the same time via email to clarenceb@uca.edu and to tvelasco1@cub.uca.edu

***\*Note: Include the following set of comments at the top of your source code for all assignments.***

***// Student Name:***

***// Assignment #: (Example: A9-1)***

***// Lab Time: Tuesday 2:40-4:30***

***/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Title of Program\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\****

***Author: Date of Work:***

***Design: Provide an general overall description of the program***

***Input:***

***Process:***

***Output:***

***\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/***

**1. *(Save this file as* A9-1.cpp***.)*

This program is a game of chance, involving the totals on 3 six-sided dice. In this game, the player makes a bet and then rolls three dice. If the total is odd, then the player loses his money; if the total is even, then the player gets his money back, but does not make any money. If the total is between 13 and 18, the player gets a bonus payout, as listed in the following table:

|  |  |
| --- | --- |
| Sum of Dice | Bonus Payout Multiplier |
| 18 | 7 |
| 17 | 5 |
| 16 | 3 |
| 15 | 3 |
| 14 | 1 |
| 13 | 1 |

(Note: rolling a 14 or a 16 will earn more than a 13 or a 15, because 14 and 16 are even, and the player will receive his bet, in addition to the bonus payout.)

The payout multiplier determines how much the player will receive, based on the size of the bet and the sum of the dice. For instance, if the player bets $5.00 and the sum of the dice is 16, then the player will receive $5.00 + 3 x $5.00 = $20.00, because of getting his money back because the sum is even (payout multiplier of 1) and because the bonus payout multiplier for 16 is 3.

In the program, the graphics display will show an image of the values on the three dice, with an announcement of whether they won or lost and what they won, based on their bet. In the terminal window, the user will be asked how much the player wants to bet and will display their current balance.

At the start of the program, the player will enter his or her name, and the total amount of money with which they are starting. After each round of betting, the player will be asked whether to continue or to stop and cash in their money.

For each round, the following will happen:

1. The player will enter their bet (which is a positive integer dollar amount);
2. The three dice will be rolled, randomly generating 3 numbers between 1 and 6;
3. The results on the three dice will be displayed in the graphics display;
4. The total of the three dice will be displayed in the graphics display;
5. An announcement about whether the player won or lost will be displayed in the graphics display;
6. If the player won, the amount that the player won for that round will be displayed in both the graphics display and in the terminal;
7. The player’s total current balance will be displayed in the terminal;
8. The player will be asked whether to continue playing.

The main program will control the overall flow of program, in a do-while loop, in addition to asking for the player’s name and initial starting balance. Functions will be written for several of the steps in the betting round.

int EnterBet();

Uses a do-while loop to ask for and input the amount of the bet (must be a positive integer). Returns integer value of the bet.

void RollThreeDice(int & Dice1, int & Dice2, int & Dice3);

Uses the random number generator to generate three random numbers between 1 and 6.

void DisplayThreeDice(int Dice1, int Dice2, int Dice3);

Displays the images showing the value of the three dice, by calling DisplaySingleDie() with the appropriate information.

void DisplaySingleDie(int Dice1, int x1, int y1);

Displays the image of a single die starting with the upper left corner at (x1,y1).

int CalculateAndDisplayResults(int Bet, int Dice1, int Dice2, int Dice3);

Displays results of the roll of the dice (win/lose, amount of winnings). Returns amount of winnings, which is either 0 or their bet plus their bet times the bonus payout multiplier. (Steps4-6)

Steps 7 and 8 can be performed within the main function.