**ECCS 1611 – Programming 1**

**Dr. Coffman-Wolph – Fall Semester 2020**

**MP2 – Roll’em Pigs! Due Thursday 1 October 2020**

The game of Pig is a simple two player dice game in which the first player to reach 100 or more points wins. Players take turns. On each turn, a player rolls a pair of six-sided dice. After each roll, the individual die values are examined:

* If neither die shows a 1, the sum of the dice is added to the current turn total. The player can now elect to roll again or to stop. If the player chooses to stop, then the sum of all of the rolls for the current term (i.e. the current turn total) is added to the player’s game total. If the player rolls again, the both the current turn and game totals are at risk of being lost.
* If a single 1 is rolled, the player’s score for the current turn is lost (i.e. the current term total is set to zero) and the turn ends.
* If two 1’s are rolled, the player’s score for the entire game is lost (i.e. the game total is set back to zero) and the turn ends.

If a player reaches 100 or more points after stopping then that player wins.

You are to write a C++ program that plays the game of Pig where one player is a human and the other is the computer. Allow the human to input either ‘r’ or ‘R’ to roll again, or either ‘s’ or ‘S’ to stop. The computer player should play according to the following rule: keep rolling on the computer’s turn until it has accumulated 25 or more points for that turn, then stop rolling. If the computer can win by stopping, or if at least one 1 has been rolled, then the computer’s turn ends at that point. All roll values – for both the human and the computer player – are to be displayed on the screen. Please let the human player roll first.

**It is strongly recommended that you play this game at least once with a friend or classmate**

**before starting to code a solution.**

Write your program using at least the following functions (yes you can have more functions):

int rollDie( void );

bool isTurnScoreLost( int die1value, int die2value );

bool isGameScoreLost( int die1value, int die2value );

char getUserInput( void );

* The rollDie function will perform the rolling of an individual die. The die is six sided. You will be using random number generated. There was a 5-minute video on Random Numbers in C++ (it was the sample video for the video #1 project). You will also be using % to get the values from 1 and 6. C++ Code examples: <https://sheir.org/mf/dice-random-numbers/> and <https://subscription.packtpub.com/book/application_development/9781788391818/1/ch01lvl1sec10/rolling-the-dice>
* The isTurnScoreLost and isGameScoreLost functions are similar in that the input parameters are the current rolled dice values and the returned value is a Boolean value indicating whether if either the player’s turn score is lost because one of the die values shows a 1 or the player’s game score is to be reset to zero because both die values are 1.
* The getUserInput function is used to prompt the human player as whether to continue rolling the dice (by pressing the ‘R’ key) or to stop rolling the dice and keep the points scored during the current turn (by pressing the ‘S’ key). The function is to return either the ‘r’ or the ‘s’ character. The function is to make some attempt at idiot-proofing the input, including repeated prompts for when an incorrect input is entered.

Additionally, you will write a program in lab that will unit test the isTurnScoreLost and isGameScoreLost functions by allowing the user to enter the values for die1 and die2, then call the functions and display the result.

What you are going to Submit: (1) Source code, (2) Screenshots of run, and (3) Scoresheet