

ECCS 1611 – Programming 1 – Fall Semester 2022

MP2 – Roll'em Pigs! Due Thursday 20 October 2022

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 turn (*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 turn total is set to zero) and the turn ends.
- If two 1's are rolled, the player's total 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 20 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:

```
int  rollDie( void );
bool isTurnScoreLost( int dielvalue, int die2value );
bool isTotalScoreLost( int dielvalue, int die2value );
char getUserInput( void );
bool isWinningScore( int score );
```

- The `rollDie` function will perform the rolling of an individual die.
- The `isTurnScoreLost` function takes as input parameters the current rolled dice values and returns a Boolean value of `true` if at least one of the die values shows a 1, resulting in the loss of all points accumulated during that turn.
- The `isTotalScoreLost` function also takes as input parameters the current rolled dice values, but returns a Boolean value of `true` if both die values are 1, resulting in the total loss of all points accumulated in the game.
- 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.
- The `isWinningScore` function returns `true` if the passed score is 100 or more points, `false` otherwise.

This MP assignment will be evaluated only during Lab on 20 October, with all materials submitted before the end of lab.