Many people enjoy playing games as a way to relax. Others play games to keep mentally challenged. Computers have been helpful in allowing people to focus on playing the game, without worrying about the details of tracking the game status. They are also useful in providing adversaries for multi-player games.

The Game of Pig

In the Game of Pig, two opposing players attempt win by being the player with the most total points after at least one player exceeds 100 total points.

At the beginning of the game, both players have 0 total points. In each round, player 1 takes a turn, and player 2 takes a turn. The game ends if at the end of a round, at least one of the players has 100 or more points. The winner is the player with the most total points.

The player begins a turn with 0 turn points. The player rolls a six sided die. If the die roll produces a 1, then the player’s turn points are removed, and their turn is over. If any other number is rolled (2-6), the roll is added to the player’s turn points. The player now chooses whether to quit the turn, or continue the turn. If the player quits the turn, their turn points are added to their total points. If the player continues, then the player rolls the die again, and follows the above outline based on the value rolled.

Assignment

Write a program to allow two players to play the Game of Pig against each other.

Hints

- You will want to break the program up into several smaller functions.
- You should test each function separately to be sure that it is working correctly.
- We recommend creating the smaller functions first. Then, create the functions that use them.
- The functions you create are up to you. However, we suggest you consider operations like this:
  - Give instructions
  - Roll the die
  - Ask the user if they want to continue
  - Determine if a turn is over
  - Take a single turn
  - Play one game
  - Run the whole program

Extra Challenges

- Make the game work for any number of players.
- Ask the players for names and use them instead of player numbers.
- Allow the user to choose the number of sides on the dice.
- Allow the user to choose the target score, instead of 100.
- Allow the user to choose the number to terminate a turn.
- Allow the user to choose multiple numbers that will terminate a turn.
- Create a computer player that plays for player two.
- Any other feature you would like to see in this game.

Show Off Your Work

To receive credit for this assignment, you must show your source code and demonstrate your running program.

Ask your instructor who they would like you to show the assignment to.

Potential Session

Welcome to the Game of Pig. To win, be the player with the most points at the end of the game. The game ends at the end of a round where at least one player has 100 or more points.

On each turn, you may roll the die as many times
as you like to obtain more points. However, if you roll a 1, your turn is over, and you do not obtain any points that turn.

Player 1 has 0 points.  
Player 2 has 0 points.  

Player 1 press enter to begin your turn.

You rolled a 5  
Your turn points are now 5.  
Continue rolling (0=no,1=yes)? 1

You rolled a 5  
Your turn points are now 10.  
Continue rolling (0=no,1=yes)? 1

You rolled a 6  
Your turn points are now 16.  
Continue rolling (0=no,1=yes)? 1

You rolled a 3  
Your turn points are now 19.  
Continue rolling (0=no,1=yes)? 2

Turn over

Player 1 has 19 points.  
Player 2 has 0 points.

Player 2 press enter to begin your turn.

You rolled a 3  
Your turn points are now 3.  
Continue rolling (0=no,1=yes)? 1

You rolled a 1  
Turn over

Player 1 has 19 points.  
Player 2 has 0 points.

Player 1 press enter to begin your turn.

You rolled a 6  
Your turn points are now 6.  
Continue rolling (0=no,1=yes)? 1

You rolled a 4  
Your turn points are now 10.  
Continue rolling (0=no,1=yes)? 1

You rolled a 4  
Your turn points are now 14.  
Continue rolling (0=no,1=yes)? 1

You rolled a 5  
Your turn points are now 19.  
Continue rolling (0=no,1=yes)? 2

Turn over

Player 1 has 38 points.  
Player 2 has 0 points.

Player 2 press enter to begin your turn.

You rolled a 2
Your turn points are now 2.
Continue rolling (0=no,1=yes)? 1

You rolled a 3
Your turn points are now 5.
Continue rolling (0=no,1=yes)? 1

You rolled a 2
Your turn points are now 7.
Continue rolling (0=no,1=yes)? 1

You rolled a 6
Your turn points are now 13.
Continue rolling (0=no,1=yes)? 1

You rolled a 4
Your turn points are now 17.
Continue rolling (0=no,1=yes)? 1

You rolled a 1
Turn over
========================================

Player 1 has 38 points.
Player 2 has 0 points.
========================================

Player 1 press enter to begin your turn.

You rolled a 3
Your turn points are now 3.
Continue rolling (0=no,1=yes)? 1

You rolled a 4
Your turn points are now 7.
Continue rolling (0=no,1=yes)? 1

You rolled a 1
Turn over
========================================

Player 1 has 38 points.
Player 2 has 0 points.
========================================

Player 1 press enter to begin your turn.

You rolled a 3
Your turn points are now 3.
Continue rolling (0=no,1=yes)? 1

You rolled a 6
Your turn points are now 9.
Continue rolling (0=no,1=yes)? 1

You rolled a 4
Your turn points are now 13.
Continue rolling (0=no,1=yes)? 1

You rolled a 2
Your turn points are now 15.
Continue rolling (0=no,1=yes)? 1

You rolled a 1
Turn over
========================================

Player 1 has 38 points.
Player 2 has 0 points.
========================================

Player 1 press enter to begin your turn.

You rolled a 3
Your turn points are now 3.
Continue rolling (0=no,1=yes)? 1

You rolled a 5
Your turn points are now 8.
Continue rolling (0=no,1=yes)? 1

You rolled a 6
Your turn points are now 14.
Continue rolling (0=no,1=yes)? 1

You rolled a 6
Your turn points are now 20.
Continue rolling (0=no,1=yes)? 1

You rolled a 2
Your turn points are now 22.
Continue rolling (0=no,1=yes)? 1

You rolled a 5
Your turn points are now 27.
Continue rolling (0=no,1=yes)? 2

Turn over
==================================================
Player 1 has 65 points.
Player 2 has 0 points.
==================================================
Player 2 press enter to begin your turn.

You rolled a 6
Your turn points are now 6.
Continue rolling (0=no,1=yes)? 1

You rolled a 3
Your turn points are now 9.
Continue rolling (0=no,1=yes)? 1

You rolled a 1
Turn over
==================================================

Player 1 has 65 points.
Player 2 has 0 points.
==================================================
Player 1 press enter to begin your turn.
1
You rolled a 3
Your turn points are now 3.
Continue rolling (0=no,1=yes)? 1

You rolled a 2
Your turn points are now 5.
Continue rolling (0=no,1=yes)? 1

You rolled a 3
Your turn points are now 8.
Continue rolling (0=no,1=yes)? 1

You rolled a 4
Your turn points are now 12.
Continue rolling (0=no,1=yes)? 1

You rolled a 4
Your turn points are now 16.
Continue rolling (0=no,1=yes)? 2

Turn over
==================================================
Player 1 has 81 points.
Player 2 has 0 points.

Player 2 press enter to begin your turn.

You rolled a 1
Turn over

Player 1 has 81 points.
Player 2 has 0 points.

Player 1 press enter to begin your turn.

1
You rolled a 3
Your turn points are now 3.
Continue rolling (0=no, 1=yes)? 1

You rolled a 6
Your turn points are now 9.
Continue rolling (0=no, 1=yes)? 1

You rolled a 3
Your turn points are now 12.
Continue rolling (0=no, 1=yes)? 1

You rolled a 3
Your turn points are now 15.
Continue rolling (0=no, 1=yes)? 1

You rolled a 5
Your turn points are now 20.
Continue rolling (0=no, 1=yes)? 1

You rolled a 4
Your turn points are now 24.
Continue rolling (0=no, 1=yes)? 1

You rolled a 4
Your turn points are now 28.
Continue rolling (0=no, 1=yes)? 2

Turn over

Player 1 has 109 points.
Player 2 has 0 points.

Player 2 press enter to begin your turn.

1
You rolled a 1
Turn over

Player 1 has 109 points.
Player 2 has 0 points.

Player 2 press enter to begin your turn.

1
You rolled a 3
Your turn points are now 3.
Continue rolling (0=no, 1=yes)? 1

You rolled a 3
Your turn points are now 6.
Continue rolling (0=no, 1=yes)? 1

You rolled a 4
Your turn points are now 10.
Continue rolling (0=no, 1=yes)? 1

You rolled a 2
Your turn points are now 12.
Continue rolling (0=no, 1=yes)? 1

You rolled a 6
Your turn points are now 18.
Continue rolling (0=no, 1=yes)? 1

You rolled a 1
Turn over
The game is over.
Player 1 has 109 points.
Player 2 has 0 points.
Player 1 wins.