Assignment 1 - Pass the Pigs

Teresa Joseph

CSE 13S - Professor Long

Fall 2021 - RD September 30/ FD October 3

Purpose

Implement a game of "Pass the Pigs" where players take turns rolling a pig to score points.

Game Breakdown

- k number of players (2 min and 10 max)
- Each player rolls a pig of 5 possible positions to gain points
    - 0 points for side (2/7 probability)
    - 5 points for jowler/ear (2/7 probability)
    - 10 points for razorback/back (1/7 probability)
    - 10 points for trotter/upright (1/7 probability)
    - 15 points for snouter/nose (1/7 probability)
- Continue rolling until side is rolled (then pass to next player) or reach 100 or more points (then win and end the game)

Pseudocode

Libraries to include

<stdio.h> for general commands

<stdlib.h> for random generator

<limits.h> for seed range

"names.h" for accessing player names

Main function:

[Obtaining the number of players]

Prompt user to enter the number of players and label the input as *players*

If *players* is less than 2 or greater than 10:

Print error message and assume 2 players (so *players* = 2)

Else, continue with *players* = user's input

[Obtaining the seed value]

Prompt user to enter a valid unsigned seed value and label the input as *seed_value*

If *seed_value* is greater than unsigned int max (2^32-1 or UINT_MAX):

    Print error message and assume value of 2021 (so *seed_value* = 2021)

If *seed_value* is less than unsigned int min (0 - indicates negative sign):

    Print error message and assume value of 2021 (so *seed_value* = 2021)

Else, continue with *seed_value* = user's input

[Creating arrays for the pig roll]

Create array of ten 0s (the 0s represents each player's initial points, and there are 10 elements to represent the max number of players), call array *points*

Create another array that enumerates the 5 positions (side, jowler, razorback, trotter, and snouter), call it *Positions* (as stated in assignment document)

Create another array of the roll possibilities (side, side, jowler, jowler, razorback, trotter, and snouter), call it *pig* (as stated in assignment document)

[Simulating the pig roll]

Set srandom() to *seed_value* (similar to example in assignment document)

Set counter for player turn (calling it *p*) to 0

While *p* is less than *players*/the total number of players (up to last player's turn):

    Print corresponding player name from names.h and "rolls the pig"

    Randomly select value from *pig* with random() % 7 -> represents roll

    While *pig*[roll] is not equal to side:

        If *pig*[random() % 7] equals jowler:

            Print that the player rolled jowler

            Increment points[i] by 5

        If *pig*[random() % 7] equals razorback:

            Print that the player rolled razorback

            Increment points[i] by 10

        If *pig*[random() % 7] equals trotter:

            Print that the player rolled trotter

Increment points[i] by 10

If *pig*[random() % 7] equals snouter:

Print that the player rolled snouter

Increment points[i] by 15

If current player's points are 100 or more:

Break out of this while loop

Otherwise, roll again and go back to the start of this while loop

Check again if current player's points are 100 or more:

Break out of the outermost while loop if so

If *pig*[random() % 7] equals side:

Print that the player rolled side

If i equals *p*-1:

Set *p* back to 0/the first player (essentially starts a new round)

Else:

Increase *p* by 1 (moves to next player)

[Concluding game]

Find the index in *points* that corresponds to the greatest number of points

Print name of winner and their points

End the main function

Notes

- "random() % 7" makes sure that the randomly generated values are between 0 and 6 (where each number corresponds to a position in *pig* according to its index)
- Checking if the input is an integer might not be necessary (scanf should take care of this)

Overall Description

The code I created is structured so that my main function has everything I need. First, I prompt the user to enter the number of players, making sure that it satisfies the requirements described in the assignment document. I did the same with the random seed, prompting the user to enter a value and ensuring that it fits the necessary conditions.

Then, I created the arrays that I need. The array called *points*, which will be initialized to have *players* amount of zeros, will keep track of each player's points as the game progresses. As the assignment document suggests, I also enumerated *Positions* and created an array called *pig* that represents the probability of each pig position (side, jowler, razorback, trotter, and snouter).

Next is the biggest portion of my code: the pig rolling simulation. This would require setting up srandom() with *seed_value* and then entering a loop where each player takes turns rolling the pig. Though I originally wanted to use a for loop to keep track of each player's turn, I realized it would be much simpler and easier to follow along with a while loop. Ultimately, I restructured my code to do this. This loop allowed me to alter the iterator and restart the round as needed (namely when a player rolled side). In this loop, I created another while loop where I would randomly select a value with srandom() and had it represent the index of the *pig* array, thereby randomly selecting a pig position. I then checked to see which of the five pig positions it is and incremented the points array accordingly (by 0, 5, 10, or 15 points). I also checked to see if the points for each player after each roll is greater than or equal to 100. If this is true, I will break the two loops and state them as the winner. Otherwise, I will continue the loop until the winner is decided upon.

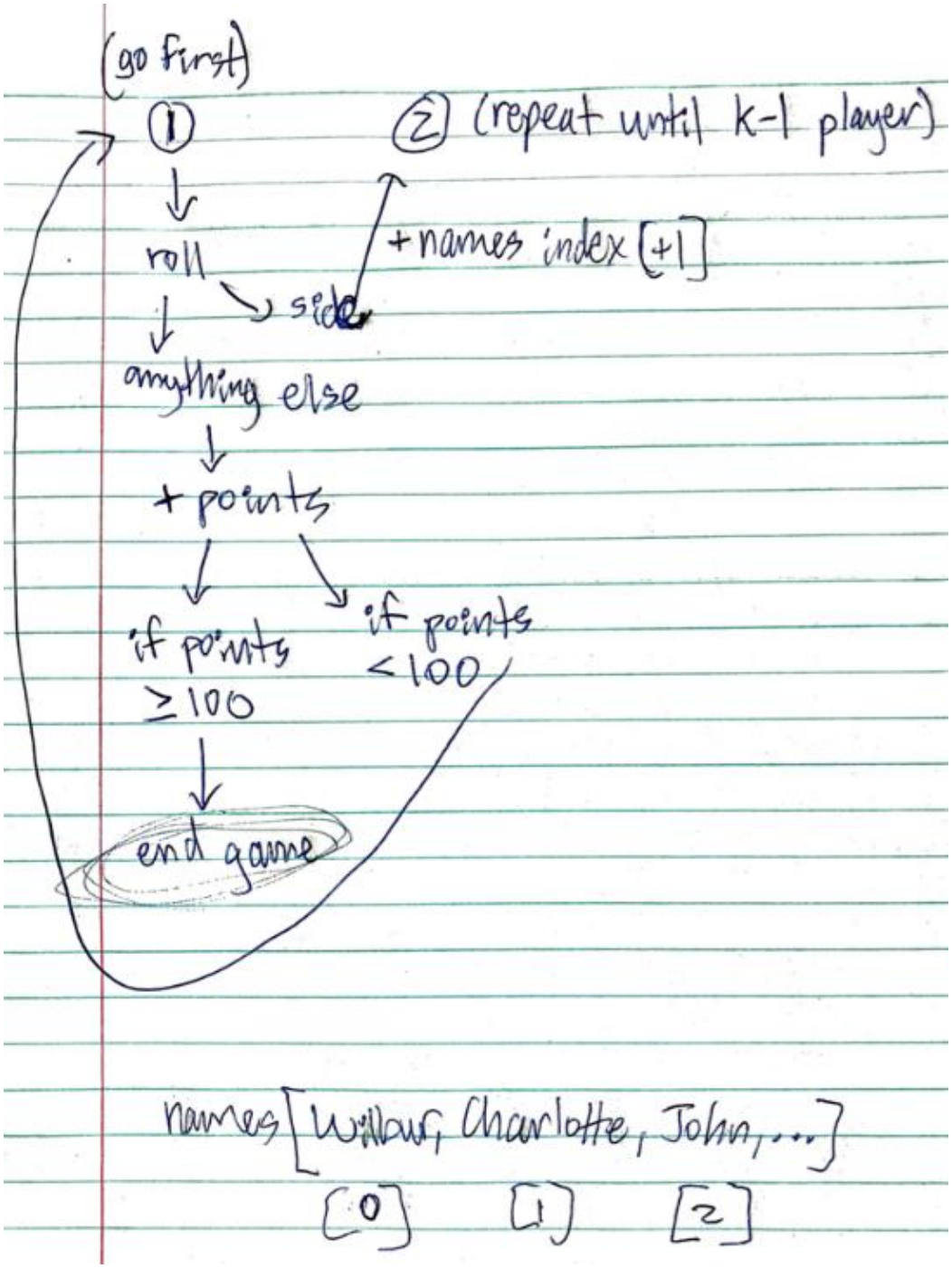
Simple Summary

- Function: main(void)
- Inputs: number of players and random seed
- Variables: *players* (number of players) and *seed_value* (random seed)
- Outputs: names of players as they take turns, which positions their rolls resulted in, and who ultimately won the game
- Process: prompt for both inputs, create arrays, simulate the pig rolls, and end the game

Goals/Intended Process

- Set up this pseudocode in C
- Address possible errors
- Swap loops for more efficient methods once running properly
- Add sufficient comments and clean up format

Other


(go first)
(1)
(2) (repeat until k-1 player)
roll
side
+names index [+1]
anything else
+points
if points ≥100
if points <100
end game
names [Wilbur, Charlotte, John, ...]
[0] [1] [2]