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CSE 13S - Computer Systems and C Programming

Assignment 1: Left, Right, and Center

The rules of the game are simple. There are some number of players (k) from $1 < k <= 10$, where each player has 3 dollars in their hand. There is also a six sided dice that the players will roll, which are labeled as follows:

dice[] = { LEFT, RIGHT, CENTER, PASS, PASS, PASS }

as such, there is a 50% chance that a PASS will be rolled and 16.666% chance of rolling a LEFT, RIGHT, or CENTER.

There are 4 outcomes when rolling the dice:

1) if the player rolled LEFT, give the player to their left $1
2) if the player rolled RIGHT, give the player to their right $1
3) if the player rolled CENTER, give $1 to the pot
4) if the player rolled PASS, do nothing for that roll

The first player will roll the dice, and with the amount of money they have, will determine 4 outcomes:

1) if the player has >= 3 dollars, roll the dice 3 times
2) if the player has 2 dollars, roll the dice 2 times
3) if the player has 1 dollar, roll the dice 1 time
4) if the player has 0 dollars, skip their turn

The game will finish until there is only one player with money left, thus winning the pot.

IMPLEMENTATION:

1) Begin by declaring the dice with it's required faces, LEFT, RIGHT, CENTER, and 3 PASSes.
2) Declare the names of the players who are playing.

3) In order to have consistency between randomness, implement a “seed”, where the seed is chosen by the user.
4) Create a variable that captures the amount of players for the game.
    a) print out “How many players? and take in user input
5) Declare variables for the pot, the current position of the player
6) Create an array (money[]) which will store the amount of money each player has.
    a) Since the game is linear and runs in tandem with the current players, the index does not have to be modified.
    b) This array will be changed throughout the course of the game
7) Create a loop that goes on forever (while(1)), which will simulate the game lasting until there is only 1 winner.
    a) The loop will only exit if the current player's money plus the amount in the pot is equal to the number of players multiplied by 3, or the total amount of money in the current game.
    b) For each player
        i) Will check how much money they currently have by checking money[pos], the money at the current position of the player.
        ii) Depending on the amount of money will determine how many rolls they get.
        iii) A for loop will simulate the amount of rolls depending on the current condition, from 1 roll to 3 rolls.
        iv) The dice will be simulated by storing a number from 0-5 using rand() function, which will be used as the index from the dice[] array.
        v) Depending on the outcome (LEFT, RIGHT, CENTER, PASS), the program will update money accordingly
            (1) if LEFT, call the function “left”, which takes in the current position and the amount of players as parameters.
                (a) will return the index of the player on the left by following the formula ((pos + players - 1) % players).
            (2) if RIGHT, call the function “right”, which takes in the current position and the amount of players as parameters.

(a) will return the index of the player on the right by following the formula ((pos + 1) % players)

(3) if CENTER, adds $1 to the pot by using "++pot".

(4) if PASS, the player will pass the roll and do nothing

vi) After each player has gone, reset the index of the current player to the beginning.

(1) In order to check for this:

(a) if the current position of the player is equal to the amount of players - 1, set pos = 0.

(b) else: will work as normal and ++pos to continue the game.

8) If the loop has exited due to a winner, the program will announce the winner, the amount they have won, and the amount of money they currently have in their bank.