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Homework #5

**Problem Statement:**

The goals of the programming assignment, homework #5, was to design program that simulates the board game called Payday. The program designs the game board and two players move along through the board undergoing events that alter their money. Normal inputs to the program are only for whether or not if the player wants to roll or pass as a character. I added an additional input request for a character to determine whether to use a randomized board or a standard board. The output of the program is the game board itself and the player’s money each turn. When the game is over, it outputs the total for each and determines a winner. It required error handling to handle the character inputs to ensure they were equal to what was requested.

**Design:**

There were 5 global data structures used which were all integers, two constants to declare the size of the 2d array and three that were counters. The major data structure used was a 2d character array for the game board. Additionally, integers and doubles were used to handle the player’s locations and their money. The algorithm seemed complex and was difficult to implement correctly but it ended up being quite simple at the end. There was lots of tests to determine the location in the turn function to ensure the algorithm was followed correctly.

**Implementation:**

My implementation process was to work at a steady pace and section off the areas that were required. I started by placing comments on the entire section and then developing parts of the program at a time and gradually uncommenting the program. My development timeline was rather quick, with minor adjustments on error processing.

**Testing:**

I tested this program by using correct inputs that just allowed the players to play through the game. Special cases I tested included incorrect inputs, of which the program just prompted again and ran it twice to ensure that each player won once – in order to display that once player one reached the end, player 2 still had a turn left and if player 2 won, the game was over.

**Conclusions:**

The programming project was a success other than procrastinating and barely not finishing on time. I wouldn’t change anything in my coding process differently in the future other than start time. The project took approximately 4.5 hours to code which included the error correction once the game board was made and player locations were displayed. An additional hour was spent the following day (after it was due) to randomize the board and add in additional tests. \*Considered starting both players at some value in order to not have so many negative totals, but left starting at $0\*

**Typescript:**

Script started on Fri 03 Apr 2015 01:48:03 PM CDT

]0;csce\_user@cscuser-VirtualBox: ~csce\_user@cscuser-VirtualBox:~$ g++ -Wall hw5.cpp -o hw5.exe

]0;csce\_user@cscuser-VirtualBox: ~csce\_user@cscuser-VirtualBox:~$ ./hw5.exe

Welcome to Payday! This is a game where you try to earn more money in a month than the other player. Each user will decide to roll the dice or pass their turn. The player will then move across the board. Certain events happen on the board when a player land on the corresponding letter. Once a player reaches the end of the month, their game is over.

Would you like to randomize the game board?

Enter R for [r]andomization or S for [s]tandard board:

u

Sorry, that didn't quite work.

Please enter R for randomization or S for standard board:

s

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $0

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $0

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 1

Oh no! Your bills are overdue. You paid $850 plus $100 in fees

+---+---+---+---+---+---+

| 2 | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-950

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| 2 | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-950

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 3

It's pay day and you worked holidays! You received $1250

+---+---+---+---+---+---+

| B | C | G | 2 | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $300

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | 2 | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $300

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 4

Your dog is fat and needed some food. You had to pay $20

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | 2 | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $280

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | 2 | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $280

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 2

Time to pay the bills. You paid $850

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | 2 | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-570

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | 2 | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-570

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 6

Oh no! Your bills are overdue. You paid $850 plus $100 in fees

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | 2 | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-1520

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | 2 | C | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-1520

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 1

You were in a car wreck, ouch :(. You had $40,000 in repairs.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | 2 | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-41520

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | 2 | P |

+---+---+---+---+---+---+

| P | F | F | P | L | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $-41520

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 6

You won Mega Millions Lottery!!! You received $100,000

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | 2 | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $58480

Player 1, type an R to roll or P to pass this turn: p

Player 1 has passed.

+---+---+---+---+---+---+

| B | C | G | P | L | C |

+---+---+---+---+---+---+

| F | F | P | B | B | L |

+---+---+---+---+---+---+

| F | G | F | B | C | P |

+---+---+---+---+---+---+

| P | F | F | P | 2 | G |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $58480

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 6

The game is over

The final totals are:

Player 1 = $0

Player 2 = $58480

The winner is Player 2

]0;csce\_user@cscuser-VirtualBox: ~csce\_user@cscuser-VirtualBox:~$ ./hw5.exe

Welcome to Payday! This is a game where you try to earn more money in a month than the other player. Each user will decide to roll the dice or pass their turn. The player will then move across the board. Certain events happen on the board when a player land on the corresponding letter. Once a player reaches the end of the month, their game is over.

Would you like to randomize the game board?

Enter R for [r]andomization or S for [s]tandard board:

r R

The board has been randomized.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $0

Player 2 has $0

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 1

It's pay day! You received $1000

+---+---+---+---+---+---+

| 1 | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $1000

Player 2 has $0

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 2

It's pay day! You received $1000

+---+---+---+---+---+---+

| 1 | 2 | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $1000

Player 2 has $1000

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 2

It's pay day and you worked holidays! You received $1250

+---+---+---+---+---+---+

| P | 2 | 1 | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $2250

Player 2 has $1000

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 5

It's pay day! You received $1000

+---+---+---+---+---+---+

| P | P | 1 | P | G | F |

+---+---+---+---+---+---+

| 2 | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $2250

Player 2 has $2000

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 3

Your dog needed some food. You had to pay $10

+---+---+---+---+---+---+

| P | P | P | P | G | 1 |

+---+---+---+---+---+---+

| 2 | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $2240

Player 2 has $2000

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 5

Time to pay the bills. You paid $850

+---+---+---+---+---+---+

| P | P | P | P | G | 1 |

+---+---+---+---+---+---+

| P | G | G | P | C | 2 |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $2240

Player 2 has $1150

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 1

It's pay day and you worked holidays! You received $1250

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| 1 | G | G | P | C | 2 |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $3490

Player 2 has $1150

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 1

It's pay day and you worked holidays! You received $1250

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| 1 | G | G | P | C | B |

+---+---+---+---+---+---+

| 2 | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $3490

Player 2 has $2400

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 3

It's pay day and you worked holidays! You received $1250

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | 1 | C | B |

+---+---+---+---+---+---+

| 2 | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $4740

Player 2 has $2400

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 5

Oh no! Your bills are overdue. You paid $850 plus $100 in fees

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | 1 | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | 2 |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $4740

Player 2 has $1450

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 1

You were in a car wreck, ouch :(. You had $40,000 in repairs.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | 1 | B |

+---+---+---+---+---+---+

| P | P | G | B | B | 2 |

+---+---+---+---+---+---+

| P | B | P | P | C | B |

+---+---+---+---+---+---+

Player 1 has $-35260

Player 2 has $1450

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 5

You were in a minor car wreck. You had $15,000 in repairs.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | 1 | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | 2 | B |

+---+---+---+---+---+---+

Player 1 has $-35260

Player 2 has $-13550

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 6

Oh no! Your bills are overdue. You paid $850 plus $100 in fees

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | 1 | B |

+---+---+---+---+---+---+

| P | B | P | P | 2 | B |

+---+---+---+---+---+---+

Player 1 has $-36210

Player 2 has $-13550

Player 2, type an R to roll or P to pass this turn: p

Player 2 has passed.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | 1 | B |

+---+---+---+---+---+---+

| P | B | P | P | 2 | B |

+---+---+---+---+---+---+

Player 1 has $-36210

Player 2 has $-13550

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 5

It's pay day and you worked holidays! You received $1250

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | 1 | 2 | B |

+---+---+---+---+---+---+

Player 1 has $-34960

Player 2 has $-13550

Player 2, type an R to roll or P to pass this turn: p

Player 2 has passed.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | 1 | 2 | B |

+---+---+---+---+---+---+

Player 1 has $-34960

Player 2 has $-13550

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 1

You were in a car wreck, ouch :(. You had $40,000 in repairs.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | 3 | B |

+---+---+---+---+---+---+

Player 1 has $-74960

Player 2 has $-13550

Player 2, type an R to roll or P to pass this turn: p

Player 2 has passed.

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | 3 | B |

+---+---+---+---+---+---+

Player 1 has $-74960

Player 2 has $-13550

Player 1, type an R to roll or P to pass this turn: r

Player 1 rolled a 4

Player 1 has reached the end. Player 2 still has one turn remaining

+---+---+---+---+---+---+

| P | P | P | P | G | F |

+---+---+---+---+---+---+

| P | G | G | P | C | B |

+---+---+---+---+---+---+

| P | P | G | B | B | B |

+---+---+---+---+---+---+

| P | B | P | P | 2 | B |

+---+---+---+---+---+---+

Player 1 has $-74960

Player 2 has $-13550

Player 2, type an R to roll or P to pass this turn: r

Player 2 rolled a 5

The game is over

The final totals are:

Player 1 = $-74960

Player 2 = $-13550

The winner is Player 2

]0;csce\_user@cscuser-VirtualBox: ~csce\_user@cscuser-VirtualBox:~$ exit

Script done on Fri 03 Apr 2015 01:49:16 PM CDT