

# Assignment 1 – Pass the Pigs

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## Purpose

The purpose of this program is to implement the dice game Pass the Pigs created by David Moffat. The game involves an asymmetrical dice in which the position it rolls out on enables a certain number of points. The game ends when once a player hits 100 points or more. The purpose of this assignment is to model the game in C and create abstractions of the pig itself and other important aspects like the user's input the points assigned to each side, and the probability of getting each rollout.

## How to Use the Program

In order to use my program you must operate in the terminal and enter your answers when you are prompted certain questions. These questions include how many players are in the game and the number of the random-number seed you'd like to use. The answers the user must insert are not complicated at all and should be a simple integer, anything more complex or larger will result in an error message.

## Program Design

My program contains one executable with a main function and at the start of the program, I initialize certain global variables used throughout my program with their values.

Next, I have a pseudorandom number generator within a for loop that will replicate the randomness of rolling a die.

Then, I will utilize the scanf function to look at my user's input for the number of players and ensures it is in range. If it isn't an if statement executes and an error message will appear and it will default the number of players 2.

The same process occurs with the SEED definition and input given by the user and if it isn't an adequate seed amount, it will default to 2023.

Next, I will use iteration with a for loop and go through and set each player's points to 0 at the start of the program.

I make use of the Boolean library as well and set the winner or player won to false and I use this as a parameter in the following for loops, while loops, and if statements. I have a check at the beginning to see if a player has won yet and if they haven't my code will go through the data structure of a switch case to go through each position and add the designated points with each position.

Then I have a final if statement to check if a player has gotten 100 or more points and if they have the program is done.

## Data Structures

Within my main function,

I have much iteration with for and while loops, checks with if statements, and a switch case structure to keep track and enumerate each players points.

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## Function Descriptions

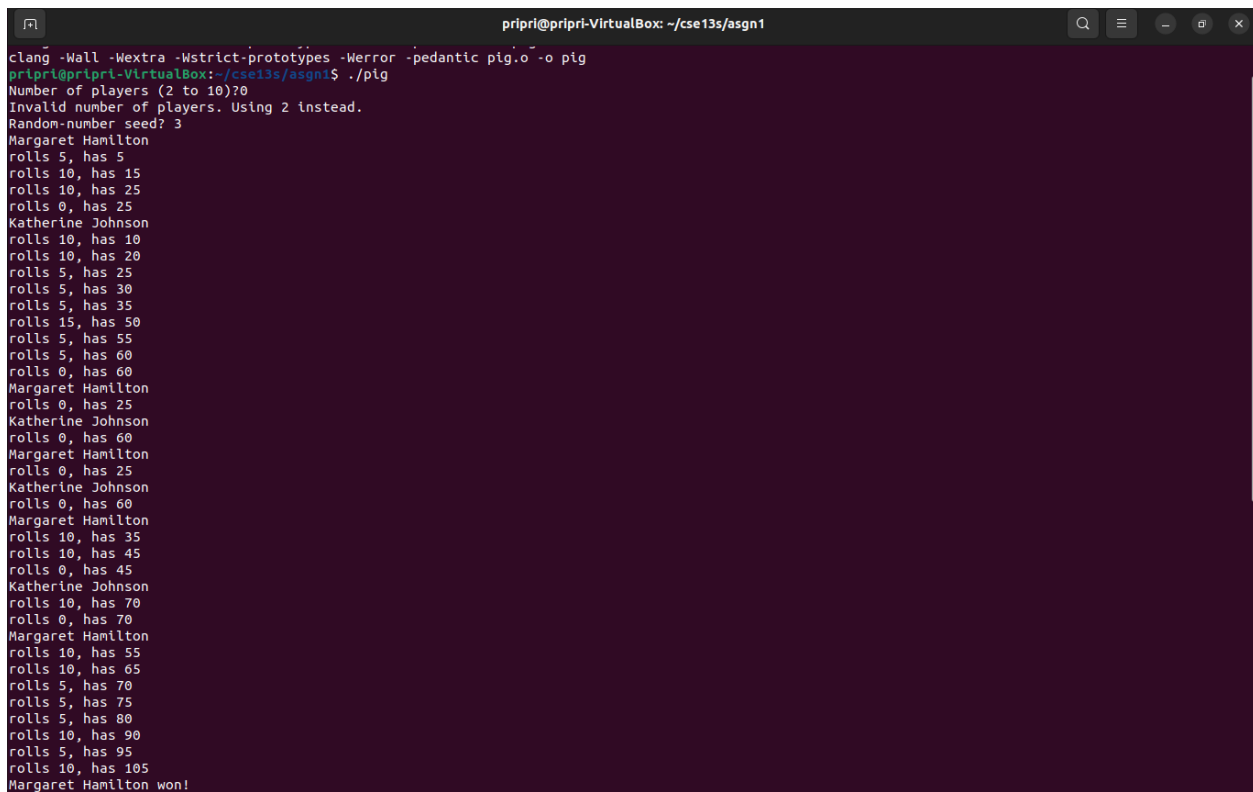
For each function in your program, you will need to explain your thought process. This means doing the following

- The inputs of every function: there are only 2 inputs that are needed. I use scanf to check the number of players as well as the seed input to read the input and if statements to ensure these inputs are in range and adequate inputs and if not an error message occurs.
- The outputs of every function: for my outputs I utilize printf statements within and outside of my switch case. I use percentages d and s and proper formatting to ensure every output is given in the format needed.
- My first for loop utilizes srand and ensures random numbers are generated. The beginning scanf function just scan each user's input. My while loops are made as buffers to check that a player hasn't won yet and then structures like my switch case can execute. I started thinking about doing a bunch of if statements but I remembered that a switch case may just be more practical and work for how I think of this assignment so I utilized a switch case for adding each player's points. scan

## Results

I feel my while loops and for loop structures could be better organized and cleaned up but overall my program achieves everything it should according to the assignment pdf.

You can include screenshots of program output, as I have in Fig. 1.



```
clang -Wall -Wextra -Wstrict-prototypes -Werror -pedantic pig.o -o pig
pripri@pripri-VirtualBox:~/cse13s/asn1$ ./pig
Number of players (2 to 10)? 2
Invalid number of players. Using 2 instead.
Random-number seed? 3
Margaret Hamilton
rolls 5, has 5
rolls 10, has 15
rolls 10, has 25
rolls 0, has 25
Katherine Johnson
rolls 10, has 10
rolls 10, has 20
rolls 5, has 25
rolls 5, has 30
rolls 5, has 35
rolls 15, has 50
rolls 5, has 55
rolls 5, has 60
rolls 0, has 60
Margaret Hamilton
rolls 0, has 25
Katherine Johnson
rolls 0, has 60
Margaret Hamilton
rolls 0, has 25
Katherine Johnson
rolls 0, has 60
Margaret Hamilton
rolls 10, has 35
rolls 10, has 45
rolls 0, has 45
Katherine Johnson
rolls 10, has 70
rolls 0, has 70
Margaret Hamilton
rolls 10, has 55
rolls 10, has 65
rolls 5, has 70
rolls 5, has 75
rolls 5, has 80
rolls 10, has 90
rolls 5, has 95
rolls 10, has 105
Margaret Hamilton won!
```

Figure 1: Screenshot of the program running.