

Assignment 1 – Pass the Pigs

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Purpose

This program simulates the game, Pass the Pigs, a game where you and some other players take turns rolling a pig shaped dice. Depending on how your pig lands you get a certain amount of points. If the pig lands on its side, you can zero points and it's the next player's turn to roll. The first player to 100 points wins the game.

How to Use the Program

The user will be prompted to select the number of players. The number must be between 2 and 10. Afterwards the user will be prompted to select the random number seed. After that you watch as the game is played and you see who rolled what. At the very end, you will see the winner.

Here is some verbatim text.

```
Number of players (2 to 10)? 3
Random-number seed? 3
```

```
Margaret Hamilton
```

```
rolls 15, has 15
```

```
rolls 5, has 20
```

```
rolls 0, has 20
```

```
Kathrine Johnson
```

```
rolls 0, has 0
```

```
Joy Buolamwini
```

```
rolls 5, has 5
```

```
rolls 0, has 5
```

```
Margaret Hamilton
```

```
.
```

```
.
```

```
.
```

```
Kartheine Johnson won!
```

Program Design

Data Structures

The only data structure I used were arrays:

1. player_name[]
2. score[].

I don't know if data types could as data structures but I'll list the ones used just in case:

- int
- char
- const

Structures I was unable to figure out include the following:

- typedef enum
- Positions

Algorithms

Pseudocode:

```
// Player Default
int players = 2;

//User input
printf("Number of players (2 to 10)? ");
int players_result = scanf("%d",&players);

//Input out of range
if (players_result < 1 || players < 2 || players > 10)
{
    fprintf(stderr, "Invalid number of players. Using 2 instead.\n");
    int players_result = 2;
};

//Default Seed
unsigned seed = 2023;

//Choose Random Seed
printf("Random-number seed? ");
int seed_assignment = scanf("%d",&seed);

//Invalid Seed
if (seed_assignment < 1) {
    fprintf(stderr, "Invalid seed. Using 2023 instead.\n");
    int seed_assignment = 2023;
};
```

```

// Dice Enum
typedef enum {SIDE, RAZORBACK, TROTTER, SNOUTER, JOWLER} Position;
const Position pig[7] =
{
    SIDE,
    SIDE,
    RAZORBACK,
    TROTTER,
    SNOUTER,
    JOWLER,
    JOWLER,
};

//Pseudorandom Numbers
for (int i = 0; i < 3; i += 1)
{
    printf("Set the random seed.\n");
    srand(SEED);
    for (int j = 0; j < 5; j += 1) {
        printf(" - generated %lu\n", random());
    }
}

```

Function Descriptions

User input: Get the number of players and the random number seed from the player.

1. Ask the user to input a number of players between 2 and 10?
2. Use whatever number is provided?
3. If the user provides an invalid number, default to 2 players and show an error message.
4. Ask the user to input a random number seed?
5. Use whatever number is provided?
6. If the user provides an invalid number, default to SEED (or 2023) and show an error message.
7. Ask the user to input a random number seed?

Name Array

1. Create a const array of player_names with 10 names inside.
2. C does not have a string data type so you must use char

Score Array

1. Create a score array for each player.
2. loop through all of the players with a for loop
3. initializing the score value to 0.

Pseudo Random Number

1. Set srand equal to the value given above in user input. This sets the random number seed.

Output

1. Set win equal to 0
2. While win is equal to 0 do the following actions
 - a. Loop through all players with a for loop (this is going to code every players turn)
 - b. Give rolls an initial value that isn't 0
 - c. While rolls is not equal to 0 do the following actions
 - i. Set roll equal to a random number between 0-6 (line must be fixed but idk how.)
 - ii. If the player rolls a 0 output the player's roll and total score and move on to the next player
 - iii. If the player doesn't roll a 0, increment the score by the roll and output the roll and total score. The player rolls again.
 - iv. If the player's score equals or exceeds 100, output the winning player and change win from 0 to 1 to exit the loop. This ends the game and returns 0.

Results

Everything runs except for one thing. The dice rolls between numbers 0-6 instead of rolling 0, 5, 10, and 15 based on the sides in the typedef enum Positions. I was unable to get it to work. I had to leave that part of the code commented out so the rest would run..

UPDATE: Everything works now!!!

References

The C Programming Language by Kernighan and Ritchie

```
yzsims@i3s-vm:~/cse13s/asgn1$ ./pig
Number of players (2 to 10)? 5
Random-number seed? 5
Margaret Hamilton
  rolls 1, has 1
Margaret Hamilton
  rolls 6, has 7
Margaret Hamilton
  rolls 3, has 10
Margaret Hamilton
  rolls 2, has 12
Margaret Hamilton
  rolls 0, has 12
Katherine Johnson
  rolls 5, has 5
Katherine Johnson
  rolls 3, has 8
Katherine Johnson
  rolls 1, has 9
Katherine Johnson
  rolls 2, has 11
Katherine Johnson
  rolls 4, has 15
Katherine Johnson
  rolls 0, has 15
Joy Buolamwini
  rolls 1, has 1
Joy Buolamwini
  rolls 6, has 7
Joy Buolamwini
  rolls 6, has 13
Joy Buolamwini
  rolls 6, has 19
Joy Buolamwini
```

Figure 1: Runs with invalid input (However the rolls are using the wrong numbers.)

```
Margaret Hamilton
  rolls 1, has 100
Margaret Hamilton won!
yzsims@13s-vm:~/cse13s/asgn1$ ./pig.c
-bash: ./pig.c: Permission denied
yzsims@13s-vm:~/cse13s/asgn1$ ./pig
Number of players (2 to 10)? 1
Invalid number of players. Using 2 instead.
Random-number seed? 0
Invalid seed. Using 2023 instead.
Margaret Hamilton
  rolls 6, has 6
Margaret Hamilton
  rolls 2, has 8
Margaret Hamilton
  rolls 3, has 11
Margaret Hamilton
  rolls 1, has 12
Margaret Hamilton
  rolls 2, has 14
Margaret Hamilton
  rolls 2, has 16
Margaret Hamilton
  rolls 6, has 22
Margaret Hamilton
  rolls 6, has 28
Margaret Hamilton
  rolls 6, has 34
Margaret Hamilton
  rolls 4, has 38
Margaret Hamilton
  rolls 5, has 43
Margaret Hamilton
  rolls 6, has 49
```

Figure 2: Runs with invalid input