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3 October 2021

CSE 13S Fall 2021
Assignment 1 - Pass the Pigs
Design Document

Description of the Program:

This program creates a simple game in which at least 2 and at most 10 players roll a pig shaped die. The pig can land in 5 unique positions, with 2 being repeated for a total of 7 positions. Each player starts with 0 points and continues rolling the pig until it lands on one of its sides. Each position of the pig corresponds to different point amounts, with the sides equal to 0 points and ending the current player's turn. Landing on the back or upright earns 10 points, landing on the snout earns 15 points, and landing on the ears earns 5 points. The first player to reach 100 points or more wins.

Files in Directory:

1. pig.c
    a. This file contains the bulk of the code that lets the game run.
2. names.h
    a. This is the header file that contains the player names. The names aren't randomized, so names[2] will always be John.
3. Makefile
    a. This file formats pig.c, and gets rid of whitespace and unnecessary tabs.
4. README.md
    a. This file describes the program, how to build the program, and how to run the code. It also includes any minor errors I've found in my code.
5. DESIGN.pdf
    a. This file describes the program as well as files in the directory, provides pseudocode/ explains how to remake my code for Pass the Pigs, explains modifications I've made in my code, and gives credit for small portions of my code.

Pseudocode:

Include the following header files and libraries to use different functions, etc. in my program
names.h
ctype.h
inttypes.h
limits.h
stdio.h
stdlib.h

Initialize pig die array

Initialize playercount to 0
Ask user to input number of players
Input number of players

Check if user input is not valid
    Print error message
    Set default playercount to 2

Initialize variable SEED to 2021
Ask user to input Random Seed
Input Random Seed

Check if user input is not valid
    Print error message
    Set default SEED to 2021

Generate random seed using SEED

Initialize array called points of size playercount
Loop through array
    Set all element's values to 0

Initialize variable n to keep track of each player's turn
Initialize variable k to keep track of each player's points
Initialize loop variable condition to 1

Create a while loop with the stipulation that condition must equal 1

    Initialize variable minor to equal 1

    Create loop to check the array points
        Check if any point value is greater than or equal to 100
            Print the winner message
            Set variable condition to 0
            Set variable minor to 0

    Print the name of current player and the rolling message

    Create while loop with the stipulation that minor must equal 1

        Initialize variable position to equal the pig's position for this round

Check if the pig lands on side
Print a message of the pig's position
Set variable minor to 0

Check if the pig lands on its back
Add 10 points to this player's point count
Print a message of the pig's position
Check if the current player's points are greater than or equal to 100
Print the winner message
Set variable condition to 0
Set variable minor to 0

Check if pig lands upright
Add 10 points to this player's point count
Print a message of the pig's position
Check if the current player's points are greater than or equal to 100
Print the winner message
Set variable condition to 0
Set variable minor to 0

Check if pig lands on snout
Add 15 points to this player's point count
Print a message of the pig's position
Check if the current player's points are greater than or equal to 100
Print the winner message
Set variable condition to 0
Set variable minor to 0

Check if pig lands on ear
Add 5 points to this player's point count
Print a message of the pig's position
Check if the current player's points are greater than or equal to 100
Print the winner message
Set variable condition to 0
Set variable minor to 0

Increment the variable n by 1 to go to the next player's turn
Increment the variable k by 1 to access the next player's points

Design Process/ Modifications:

- Fixed the input process for the Random Seed. Changed the int type to int64_t.
- Added #include for inttypes.h and ctype.h

- Generated the random seed properly by only calling it once in my program
- Changed the conditions for my while loops so it's easier to exit them
- Created a variable to store the current round's pig position so the program stops incrementing the seed pattern
- Changed the conditions for all if statements that check the pig position
- Changed the instructions when the pig lands in a certain position
- Matched my messages to the correct ones from running ./pig in resources/asgn1
- Formatted my incrementers for n and k to be simpler, I moved them to the end of the nested while loop

Credits:

I used the UINT_MAX as the upper limit for SEED after it was suggested by Benjamin Grant and Omar Ahmadyar on an Ed post: https://edstem.org/us/courses/14178/discussion/654225

I got the idea to use the type int64_t and the library <inttypes.h> for SEED from TA Brian Mak on the class Discord.