# PROJECT 1

# <Pig Dice>

CIS-5 #47589

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## Introduction:

Title: Pig Dice

Pig Dice is a die rolling game.

The goal is to get a certain number of points based on your chosen difficulty level, in a minimum number of turns. Turns will increase by 1 every time that you roll a '1'. You receive points by rolling the die. However, if you roll a '1', then your points will reset back to the last time you chose to manually restart a round.

## Summary:

Project Size: ~155 lines.

Number of Variables: ~20 variables

This project contains concepts we have learned up until now, but without the use of any functions or arrays. It has potential to be extended onto next project, however the optimization of such code would likely lead to a minimal amount of lines. So consideration of switching games for project 2 is being considered.

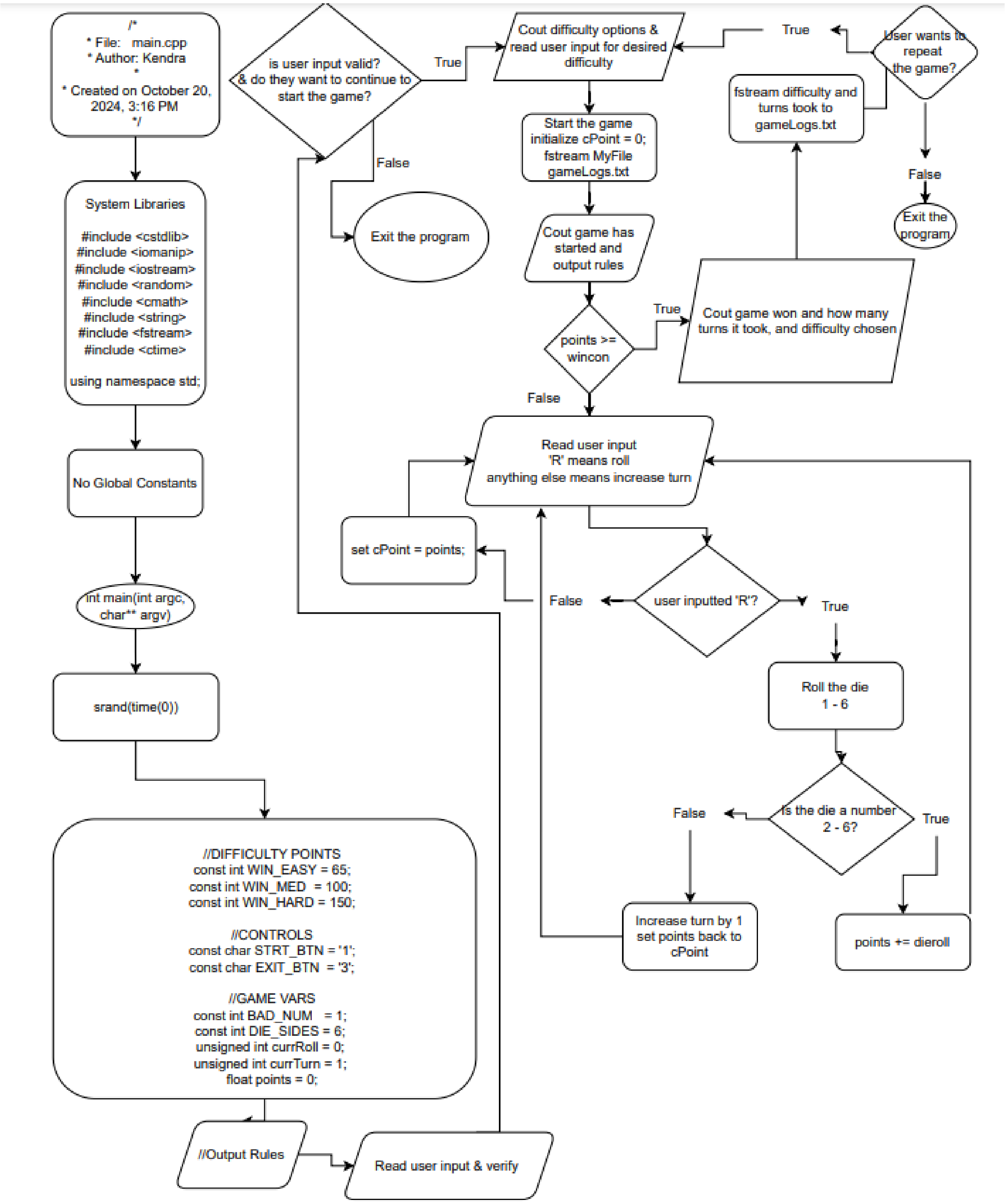
This project took me around a day and a half to complete. I am satisfied with what I could accomplish without the use of arrays/functions, but believe if I had chosen a card game that it would be immensely more difficult to complete without arrays/functions.

This project taught me that the data we use/create can be used in various ways as long as we can keep track of it's uses & check for errors consistently.

## Description:

The main purpose of this game is to highlight my proficiency with C++ thus far by using concepts right up until before arrays/functions. It can be used as a form of entertainment for those wanting to see fast they can beat the game as well.

# Flow Chart:


/*
* File: main.cpp
* Author: Kendra
*
* Created on October 20, 2024, 3:16 PM
*/
System Libraries
#include <cstdlib>
#include <iomanip>
#include <iostream>
#include <random>
#include <cmath>
#include <string>
#include <fstream>
#include <ctime>
using namespace std;
No Global Constants
int main(int argc, char** argv)
srand(time(0))
//DIFFICULTY POINTS
const int WIN_EASY = 65;
const int WIN_MED = 100;
const int WIN_HARD = 150;
//CONTROLS
const char STRT_BTN = '1';
const char EXIT_BTN = '3';
//GAME VARS
const int BAD_NUM = 1;
const int DIE_SIDES = 6;
unsigned int currRoll = 0;
unsigned int currTurn = 1;
float points = 0;
//Output Rules
Read user input & verify
is user input valid? & do they want to continue to start the game?
True
False
Exit the program
Cout difficulty options & read user input for desired difficulty
Start the game initialize cPoint = 0; fstream MyFile gameLogs.txt
Cout game has started and output rules
points >= wincon
True
False
Cout game won and how many turns it took, and difficulty chosen
fstream difficulty and turns took to gameLogs.txt
User wants to repeat the game?
True
False
Exit the program
Read user input 'R' means roll anything else means increase turn
set cPoint = points;
False
user inputted 'R'?
True
Roll the die 1 - 6
Is the die a number 2 - 6?
False
True
Increase turn by 1 set points back to cPoint
points += dieroll

## Pseudo Code:

```
Include Libraries & use namespace std;

Int main

    Initialize game constants such as control bindings, difficulty point win conditions, & number of sides on the die

    Initialize other game variables such as current amount of points, current turn


    Initialize an input to keep the game going or not

    While(input!= exit){

    Cout the rules, & take/verify user input on whether to start the game or to exit the program


    //if exit

        Exit the program

    //if start

        Cout to choose a difficulty

        Take/verify user input on which difficulty chosen

        Store chosen difficulty in a char and corresponding difficulty in a string to output later


        Cout difficulty chosen and that game has started

        Fstream to a gameLogs.txt that the game has started


        Save integer for last checkpoint = 0

        do{

            cout to roll the die enter 'R'

            //if user enters 'R'

                use math library to randomly roll the die 1-6

                cout die roll.
                //if die roll == 1
                    Reset points until last manual reset
                    Turn++
                //if die roll != 1
                    Points += die roll
            //if user enters anything else
                Turn++;
                Cout their decision and continue with loop
        } while(points < winCondition)

        Double check if user has points >= winCondition
        //if yes
            Cout victory, chosen difficulty and amount of turns it took to get there
        //if no
            Exit program, means something is wrong

    Fstream to a gameLogs.txt the number of turns it took and the difficulty used
} loop will repeat to start the game over
```

## Major Variables:

| **Type** | **Variable Name** | **Description** | **Location** |
|---|---|---|---|
| **Const Integer** | WIN_EASY | Point win con for easy difficulty | Main() |
| | WIN_MED | Point win con for medium difficulty | |
| | WIN_HARD | Point win con for hard difficulty | |
| | BAD_NUM | The number a die has to land on to end the turn | |
| | DIE_SIDES | Number of sides on the die | |
| | | | |
| **Unsigned Integer** | currRoll | The current number the die landed on | |
| | currTurn | Current turn the user is on | |
| | | | |
| **Integer** | cPoint | Last checkpoint (last time user chose to manually end the turn) | While(input!=EXIT_BTN) |
| | | | |
| **Float** | points | Keeps track of the users points | |
| | | | |
| **Char** | diff | Users chosen difficulty | |
| | roll | Users decision to roll or end the turn | |
| | | | |
| **Bool** | beatGame | Verifies if the user has beaten the game or not | |
| | | | |
| **ofstream** | MyFile | Keeps a log of the game files | |

## Program:

```
/*
 * File:   main.cpp
 * Author: Kendra
 *
 * Created on October 20, 2024, 3:16 PM
 */

#include <cstdlib>
#include <iomanip>
#include <iostream>
#include <random>
#include <cmath>
#include <string>
#include <fstream>
#include <ctime>

using namespace std;

int main(int argc, char** argv) {
    srand(time(0));

    //DIFFICULTY POINTS
    const int WIN_EASY = 65; //NUM OF POINTS TO WIN THE GAME (easy)
    const int WIN_MED  = 100; //NUM OF POINTS TO WIN THE GAME (medium)
    const int WIN_HARD = 150; //NUM OF POINTS TO WIN THE GAME (hard)

    //CONTROLS
```

```
  const char STRT_BTN = '1';
  const char EXIT_BTN  = '3';


  //GAME VARS
  const int BAD_NUM   = 1; //THE SIDE OF THE DIE THAT WILL RESULT IN ENDING YOUR TURN
  const int DIE_SIDES = 6; //AMOUNT OF SIDES ON THE DIE
  unsigned int currRoll = 0; //THE CURRENT SIDE OF THE DIE THAT HAS BEEN ROLLED 'i.e: 5'
  unsigned int currTurn = 1; //THE CURRENT NUMBER OF TURNS THE PLAYER IS ON
  float points = 0;


  //EXPLAIN RULES
  char input;
  while(input != EXIT_BTN){
    cout << "Welcome to the game of Pig Dice!\n" <<
        "To play the game, you roll a die as many times as you'd like to try and reach \n\n" <<
        "EASY: " << WIN_EASY << " points\nMEDIUM: " << WIN_MED << " points\nHARD: " <<
WIN_HARD << " points\n\nin a minimum amount of turns.\n" <<
        "The catch is, if you roll a " << BAD_NUM << " your points will revert back to the amount of
points you had since the last time you chose to end a turn manually, and the amount of turns will
increase by 1.\n" <<
        "You may end your turn at any time to save the number of points you have, and try to
minimize the amount of turns until you reach the desired amount of points.\n" <<
        "Type " << STRT_BTN <<  " to start the game, or type " << EXIT_BTN << " to exit the
program.\n\n";


    //CAPTURE USER INPUT & START THE GAME IF REQUESTED
     cin >> input;
  //   if(input == EXIT_BTN){
  //       cout << "Exiting game...\n";
  //       exit(0);
  //   }else if(input == STRT_BTN){
  //       //DO NOTHING, CONTINUE ON WITH PROGRAM
  //   }else{
  //       cout << "Exiting game...\n";
  //       exit(0);
  //   }

    //CHOOSE DIFFICULTY
    char diff;
    string diffStr;
    int currCon;
    cout << "Please choose your difficulty...\n" <<
        "Enter 'E' for Easy   (" << WIN_EASY <<  " points)\n" <<
        "Enter 'M' for Medium (" << WIN_MED  <<  " points)\n" <<
        "Enter 'H' for Hard   (" << WIN_HARD <<  " points)\n";
    cin >> diff;

    switch(diff){
      case 'E':
        currCon = WIN_EASY;
        diffStr = "EASY";
        break;

      case 'M':
        currCon = WIN_MED;
        diffStr = "MEDIUM";
        break;

      case 'H':
```

```
    currCon = WIN_HARD;
    diffStr = "HARD";
    break;

  default :
    currCon = WIN_EASY;
    diffStr = "EASY";
    break;
}


//START THE GAME & CREATE A TEXT FILE
ofstream MyFile("gameLogs.txt");
MyFile << "\nGame Session Started\n";

cout << "\nSTARTING GAME on " <<  diffStr << " DIFFICULTY\n\n";

//GAME LOOP
char roll;
int cPoint = 0;
do{
  cout << "Roll the die by inputting 'R', or input anything else to stop your turn.\n";
  cin >> roll;

//IF THE PLAYER CHOOSES TO CONTINUE ROLLING THE DIE
  if(roll == 'R'){

    //ROLL THE DIE & OUTPUT THE RESULT
    currRoll = rand()%DIE_SIDES+1;
```

```
        cout << "You rolled a " << currRoll << '\n';


        //IF THE DIE ROLL LANDED ON '1' THEN THE PLAYER LOSES THEIR POINTS AND THE TURN # INCREASES

        if(currRoll == 1){

          points = cPoint;

          cout << "Your points have been reverted to " << cPoint << " points. You are currently on turn: " << currTurn++ << '\n';

          cout << "\nTURN: " << currTurn << '\n';

        }else{

          points += float(currRoll);

          cout << "Your current amount of points are: " << points << '\n';

        }

    //IF THE PLAYER CHOOSES TO MANUALLY END THE TURN

      }else{

        cout << fixed << setprecision(0) <<

            "You have chosen to end your turn. It is currently turn " << currTurn++ <<

            "\nYou have " << points << " amount of points.\n\n";

        cPoint = points;

      }

    }while(points < currCon);


    //ENSURE THAT THE WHILE LOOP BROKE BECAUSE PLAYER REACHED WIN CONDITION

    bool beatGame = points >= currCon ? true : false;

    if(beatGame){

      cout << "Congratulations! You have beat the game on " << diffStr << " difficulty, in " << currTurn << " turns!\n\n";

    }


    //RECORD DATA IN FILE
    const int DATANUM = 2;

    for(int i = 0; i < DATANUM; ++i){
      string output;

      if(i == 0) output = "Difficulty: " + diffStr + "\n";
      else if(i == 1) output = "Amt of Turns: " + to_string(currTurn) + "\n";
      else output = "---------\n\n";

      MyFile << output;
    }

    MyFile.close();
  }

  return 0;
}
```