FINAL PROJECT

Introduction to Programming

COUNTING AND CHOOSING

Eric Savero

2001586294

Section I

Counting and Choosing Program

Description

This program is a games collection. Choose either to train your brain with math problems or test yourself with the randomized text-based decision-making game. This program is the manifestation of everything learnt in the entirety of Introduction to Programming. Math Generator reflects the results of learning OOP with different connected with each other to run the program compared to the decision-making game which uses procedural programming with standalone functions called inside main function.

Math Generator Program

Test out your math skills, select the type of problems you desire and see how much points you can rack from your session.

Text-Based Decision-Making Program

Immerse yourself with the dark ambiguous Decision game. Get into the situation presented, choose your action and bear the outcome and consequences. The Choices made in this section should be chosen “wisely”.

Design and Planning

Main Menu

Choose math or text game

Section II



Math Menu

Choose problem types

Scenario Randomizer

Score Counter

Number Randomizer

Scenario set 1

Scenario set 2

Scenario set 3

Addition

Subtraction

Multiplication

Division

Math Generator based on Programming Challenge enhanced to present operations besides additions, multiple number randomizers and a score counter.

Text-Based Decision-Making game idea came from a finance management mini game in mobile game Hatfall without the points counter to make easier narrative freedom.

1. class project.cpp

int main()

Title screen and main menu to call Math Generator or Decision Game.

void mathChoice()

Declared in math trial.cpp, called by main function when user chooses math

void problemsPicker()

Declared in decision game.cpp, called by main function when chosen by user

decision game.cpp

void set1(int, int) – Scenario set 1

void set2(int, int) – Scenario set 2

void set3(int, int) – Scenario set 3

Scenario set arrangements determined by randomly generated numbers based on time in the problemsPicker function called in by main function after choosing. Program ends after 2 sets are finished and needs to be restarted to try your luck on other set arrangements for the sake of replay value.

math trial.cpp

|  |  |
| --- | --- |
| Randomizer | Use |
| -a: int  -b: int  -x: int  -y: int | a & b variables for addition and subtraction  x & y variables used in multiplication and division |
| +setA(): int  +setB(): int  +setX(): int  +setY(): int  +getA(): int  +getB(): int  +getX(): int  +getY(): int | Set the value of variables  Return variables value to be printed |

|  |  |
| --- | --- |
| Score | Use |
| -score: int | Initial value is 0 in start of session |
| +scoreCount(int c, int answer): void  +scorePrint(): int | Count score by matching the answer key(c) with user input(answer)  Return score value to be printed |

Randomizer

setA(); getA()

setB(); getB()

setX(); getX()

setY(); getY()

Score

scorePrint()

ScoreCount()

|  |  |
| --- | --- |
| Math | Use |
| -answer: int  -session: int | Variable for user input  Variable for looping according to sessions inserted |
| +mathPlus: void()  +mathMinus: void()  +mathMulti: void()  +mathDivid: void() | Each function generates a type of math problems for user to solve. They are made to loop according to the amount of sessions desired by the user and shows the points achieved from right answers compared to highest score possible(amount of sessions) |

Section III

1. Things Learnt

Declaring multiple classes in one file and connect them together. Score counter had to be declared in a separate class instead of declaring a simple score variable in math function otherwise it will redeclare the score variable with every loop and restart the score value.

Excessive use of random numbers with a single declaration of srand

Randomized messages congratulating and shaming the user can give a program much personality

1. Weeks spent on figuring out how to make a point counter. Looking back now, the mistake was always with the redeclaration which resets the score variable value every repetition.

Transition of habit from procedural and OOP (Object Oriented Programming). In some cases it is a lot easier to use OOP for organizing functions and simplifying by making the function once and calling it in different instances for different results

Section IV

Coding

class project.cpp

#include<iostream>

#include<iomanip>

//Each game is seperated in its own file

#include "math trial.cpp"

#include "decision game.cpp"

using namespace std;

int main(){

int choice;

// Title screen

cout<<"//=================================\\\\"<<endl

<<"||"<<setw(35) <<"||"<<endl

<<"||"<<setw(22)<<"FINAL PROJECT"<<setw(13) <<"||"<<endl

<<"||"<<setw(21) <<"Eric Savero"<<setw(14) <<"||"<<endl

<<"||" <<setw(35) <<"||"<<endl

<<"\\\\=================================//"<<endl;

// Main menu

cout<<endl

<<"Welcome" <<endl

<<"1. Math trial"<<endl

<<"2. Decision game" <<endl

<<"Other numbers to exit"<<endl

<<"Take a pick: "; cin>>choice;

switch(choice){

case 1 : mathChoice();break;

case 2 : problemsPicker();break;

default : cout<<"CHERRY BYE";

}

return 0;}

math trial.cpp

#include<iostream>

#include<cstdlib>

#include<ctime>

using namespace std;

//Randomizer for numbers to be printed in the problems

class Randomizer{

int a;

int b;

int x;

int y;

public:

//set and get each variable used in the math problems

int setA(){

this->a= rand()%900+536;

return a;

}

int getA(){

return a;

}

int setB(){

this->b= rand()%900+284;

return b;

}

int getB(){

return b;

}

int setX(){

this->x= rand()%331+49;

return x;

}

int getX(){

return x;

}

int setY(){

this->y= rand()%123+70;

return y;

}

int getY(){

return y;

}

};

// Score class to run score counting in the background

class Score{

int score= 0;

public:

void scoreCount(int c, int answer){

if(c == answer)

this->score = score+1;

}

int scorePrint(){

return score;

}

};

//Math class to arrange different math operations

class Math {

int answer;

int session;

public:

//called in mathChoice

void mathPlus(); // addition problems

void mathMinus(); //subtraction problems

void mathMulti(); //multiplication problems

void mathDivid(); //division problems

};

void mathChoice();

void Math::mathPlus(){

Randomizer num;

Score count;

// ask sessions

do{

cout<<"How many sessions? "; cin>>session;

if(session<0){

cout<<"NEGATIVE INPUT" <<endl;

}

else if(session==0){

cout<<"You sure give up easily"<<endl;

}

}while(session<0);

//the game

for(int i=0; i<session; i++)

{

int c= num.setA()+num.setB();

if(num.getA()<1000){cout<<" ";}cout<< num.getA() <<endl;

if(num.getB()<1000){cout<<" ";}cout<< num.getB() <<endl;

cout<<"----- +" <<endl;

cin>> answer;

// show score

count.scoreCount(c, answer);

cout<<"Your score: " <<count.scorePrint() <<endl;

if (answer==c){

cout<<"OH JOY!" <<endl;

}

else if (answer==c && c%3==0){

cout<<"THE INTERNET SALUTES YOU!" <<endl;

}

else if (answer==c && c%7==0){

cout<<"YOU MADE IT LOOK EASY!" <<endl;

}

else if (answer!=c && c%2==0){

cout<< "I NEVER HAD FAITH IN YOU, THE ANSWER IS " << c <<endl;

}

else{cout<< "I AM DISAPPOINTED, THE ANSWER IS " << c <<endl;

}

}

cout<<"Total score: " <<count.scorePrint() <<" / " <<session <<endl;

mathChoice();

}

void Math::mathMinus(){

Randomizer num;

Score count;

// ask sessions

do{

cout<<"How many sessions? "; cin>>session;

if(session<0){

cout<<"NEGATIVE INPUT" <<endl;

}

else if(session==0){

cout<<"Are you even trying?"<<endl;

}

}while(session<0);

//the game

for(int i=0; i<session; i++)

{

int c= num.setA()-num.setB();

if(num.getA()<1000){cout<<" ";}cout<< num.getA() <<endl;

if(num.getB()<1000){cout<<" ";}cout<< num.getB() <<endl;

cout<<"----- -" <<endl;

cin>> answer;

// show score

count.scoreCount(c, answer);

cout<<"Your score: " <<count.scorePrint() <<endl;

//show different messages

if (answer==c){

cout<<"EASY AIN'T IT?" <<endl;

}

else if (answer==c && c%3==0){

cout<<"EVERYTHING MAKES SENSE NOW!" <<endl;

}

else if (answer==c && c%2==0){

cout<<"I KNOW THIS ISN'T YOUR FIRST TIME!" <<endl;

}

else if (answer!=c && c%3==0){

cout<<"AND I THOUGHT MY JOKES WERE BAD! THE ANSWER IS " << c <<endl;

}

else{cout<< "YOUR MATH TEACHERS ARE ASHAMED! THE ANSWER IS " << c <<endl;

}

}

cout<<"Total score: " <<count.scorePrint() <<" / " <<session <<endl;

mathChoice();

}

void Math::mathMulti(){

Randomizer num;

Score count;

// ask sessions desired

do{

cout<<"How many sessions? "; cin>>session;

if(session<0){

cout<<"NEGATIVE INPUT" <<endl;

}

else if(session==0){

cout<<"Maybe you'd like something else?"<<endl;

}

}while(session<0);

//the game

for(int i=0; i<session; i++)

{

int c= num.setX()\*num.setY();

if(num.getX()<1000){cout<<" ";}cout<< num.getX() <<endl;

if(num.getY()<1000){cout<<" ";}cout<< num.getY() <<endl;

cout<<"----- x" <<endl;

cin>> answer;

//show score

count.scoreCount(c, answer);

cout<<"Your score: " <<count.scorePrint() <<endl;

// Different replies

if (answer==c){

cout<<"YOUR LIFE HAS MEANING AGAIN!" <<endl;

}

else if (answer==c && c%5==0){

cout<<"\*SLOW CLAP\*" <<endl;

}

else if (answer==c && c%3==0){

cout<<"YOU'RE THE MAN(OR WOMAN, IT DEPENDS) NOW!" <<endl;

}

else if (answer!=c && c%3==0){

cout<<"YOU WANT ROASTS WITH THAT? THE ANSWER IS " << c <<endl;

}

else{cout<< "MAYBE YOU PREFER CARD GAME? THE ANSWER IS " << c <<endl;

}

}

cout<<"Total score: " <<count.scorePrint() <<" / " <<session <<endl;

mathChoice();

}

void Math::mathDivid(){

Randomizer num;

Score count;

// Ask amount of sessions desired

do{

cout<<"How many sessions? "; cin>>session;

if(session<0){

cout<<"NEGATIVE INPUT" <<endl;

}

else if(session==0){

cout<<"Aw... I was just getting to the good part"<<endl;

}

}while(session<0);

// The game

for(int i=0; i<session;i++){

int c= num.setX()/num.setY();

if(num.getX()<100){cout<<" ";} cout<<num.getX() <<endl;

cout<<"-----" <<endl;

if(num.getY()<100){cout<<" ";}cout<<num.getY() <<endl

<<"= ";

cin>> answer;

// Present score every round

count.scoreCount(c, answer);

cout<<"Your score: " <<count.scorePrint() <<endl;

// Show different messages for every round

if (answer==c){

cout<<"YOUR BRAIN HAS EVOLVED!" <<endl;

}

else if (answer==c && c%5==0){

cout<<"YOU GOT THE TOUCH!" <<endl;

}

else if (answer==c && c%2==0){

cout<<"I LOVE YOU... ARE YOU STILL SINGLE?" <<endl;

}

else if (answer!=c && c%5==0){

cout<<"MY BUM IS ITCHY... THE ANSWER IS " << c <<endl;

}

else{cout<< "HELLO DARKNESS, MY OLD FRIEND. THE ANSWER IS " << c <<endl;

}

}

cout<<"Total score: " <<count.scorePrint() <<" / " <<session <<endl;

mathChoice();

}

// Main menu of math game

void mathChoice(){

//declare randomizer based on time

srand(time(0));

//Call in Math class

Math game;

int problem;

cout<<endl <<"MeTH GENERATOR" <<endl <<"1.(+) 2.(-) 3.(X)

4. (/) IGNORE DECIMALS" <<endl

<<"Other numbers to quit" <<endl;

cout<<"Make a choice: "; cin>>problem;

//Calling different functions based on choice

switch(problem){

case 1 : game.mathPlus();break;

case 2 : game.mathMinus();break;

case 3 : game.mathMulti();break;

case 4 : game.mathDivid();break;

default : cout<<"Toodles...";

}

}

decision game.cpp

#include<iostream>

#include<ctime>

#include<cstdlib>

#include<windows.h>

using namespace std;

// Declaration of functions used

void set1(int, int);

void set2(int, int);

void set3(int, int);

// Game scenario randomizer first called by the main function

// when decision game is chosen

void problemsPicker(){

// counter to randomize scenarios

unsigned seed= time(NULL);

srand(seed);

// Randomize scenario sets

int counter=rand()%10+1;

// Randomize outcome of player choice

int outcome= rand();

// variable for player to input throughout the game

int choice;

// Obligatory warning for decision games

cout<<"The choices you make in this part will affect the story." <<endl

<<"Choose wisely."<<endl;

// Sleep to let the player read before starting the scenarios

Sleep(1500);

// Calling scenarios based on time counter from 0 - 10

// Function orders are randomized as well

if(counter==6 || counter==9){

set1(choice, outcome);

set2(choice, outcome);

}

else if(counter==2 || counter==7){

set1(choice, outcome);

cout<<endl <<"----------------------------------------------"<<endl;

set3(choice, outcome);

}

else if(counter==3 || counter==8){

set2(choice, outcome);

cout<<endl <<"----------------------------------------------"<<endl;

set3(choice, outcome);

}

else if(counter==4 || counter==5){

set3(choice, outcome);

cout<<endl <<"----------------------------------------------"<<endl;

set1(choice, outcome);

}

else if(counter==1 || counter==10){

set2(choice, outcome);

cout<<endl <<"----------------------------------------------"<<endl;

set1(choice, outcome);

}

}

//Each function contains 2 scenarios so each function still has ordered scenarios

void set1(int choice, int counter){

cout<<endl<<"You meet Remy, an old friend back in law school who used to call you Pussyfoot" <<endl

<<"for having such soft footsteps and you've always hated that." <<endl <<endl

<<"1. Politely say hi and try to come up with small talks" <<endl

<<"2. Call him Snakefoot" <<endl;

//Keep asking input until chosen properly

do{

cout<<"What do you do? "; cin>>choice;

}while(choice<1 || choice>2);

// Each choice has 2 randomized outcomes

if(choice==1){

if((counter+1)%2==0){

cout<<"He's still mad about you calling him nigga once and he's now a pro wrestler." <<endl

<<"He breaks your neck on the spot." <<endl;cin.get();

}

else{

cout<<"He kneels down in from of you before you can say anything to apologize for the annoying words and proposed to you." <<endl

<<"He used to mock you because he loved you and still does, you accept the ring out of pity."<<endl

<<"You are now married, congratulations!" <<endl;cin.get();

}

}

else{

if((counter+1)%2==0){

cout<<"He accepts it as a joke and asks who you are, the guy next to him tell him to never mind." <<endl

<<"He doesn't remember you anymore" <<endl;cin.get();

}

else{

cout<<"You utter your insult before you notice he is crippled in a wheelchair now." <<endl

<<"He lost his legs in an attempt to save a little girl from being clobbered by a bear," <<endl

<<"the girl still ended up dead from blood loss in his arms, I hope you're proud of yourself" <<endl;cin.get();

}

}

cout<<endl <<"You are a 7-year-old kid alone at home playing the floor is the lava. " <<endl

<<"The phone suddenly starts ringing when you're surfing on the coffee table." <<endl

<<"Your parents mentioned that they won't be home in 3 hours."<<endl;

do{

cout<<"Do you keep playing(1) or go answer the phone(2)? "; cin>>choice;

} while(choice<1 || choice>2);

if(choice==1){

if((counter+1)%2==0){

cout<<"You follow the river of pure lava into a dark cave, you jump onto a rock platform once" <<endl

<<"your coffee table board completely melts." <<endl

<<"You encounter an altar, on it you see the ancient golden beeping bird." <<endl

<<"You pick it up and it's your mom asking if you want some burger" <<endl;cin.get();

}

else{

cout<<"The surfboard gives up on the overwhelming weight of your body" <<endl

<<"You sink into the lava below."<<endl;cin.get();

}

}

else{

if((counter+1)%2==0){

cout<<"It's your parents saying that they will come home late and you should go to bed" <<endl

<<"They also say they'll always love you and your uncle will come to pick you up tomorrow morning"<<endl;cin.get();

}

else{

cout<<"the phone shuts off before you reach it, you're too slow!" <<endl;cin.get();

}

}

}

void set2(int choice, int counter){

cout<<endl<<"You're the CEO of a canned food company. A country is in need of a hefty amount of food supply" <<endl

<<"after a horrifying volcano eruption, charity might be a great opportunity to gain fame from public's attention." <<endl

<<"You still have clients' orders to fullfill to maintain your professional relationships." <<endl

<<"1. Be a lad and help the needy" <<endl

<<"2. Stay loyal to your clients and ignore the needy"<<endl;

do{

cout<<"You only have the budget for one, what do you do? "; cin>>choice;

}while(choice<1 || choice>2);

if(choice==1){

if((counter+1)%2==0){

cout<<"The country is really thankful for your kindness but your clients are disappointed." <<endl

<<"over half of your clients cut their ties with you." <<endl

<<"You make a good cover model for an issue of TIMEZ magazine though" <<endl;cin.get();

}

else {

cout<<"It is later found out that the country is run by fluffy puppies." <<endl

<<"You now have a lifetime supply of puppies." <<endl

<<"You apoligize to your disappointed clients by sending them puppies in tiny dresses, they happily accept." <<endl

<<"Before you know it, the world has been dominated by puppies. YAY?" <<endl;cin.get();

}

}

else{

if((counter+1)%2==0){

cout<<"Your relationships with the cients are well-maintained, you expect the country to manage somehow." <<endl

<<"You never hear from them again."<<endl;cin.get();

}

else{

cout<<"Someone leaked the info that you leave a country in need to die." <<endl

<<"Your clients fear the day you turn on them, they cut their ties." <<endl;cin.get();

}

}

cout<<endl <<"You are on a date at an abandoned Nazi prison turned museum." <<endl

<<"Your companion looks at you expectantly" <<endl

<<"1. Use your proficiency in German speaking and history knowledge to impress them with a Nazi roleplay" <<endl

<<"2. Use your dark sense of humor to make a joke about Holocaust" <<endl;

do{

cout<<"What do you do? "; cin>>choice;

}while(choice<1 || choice>2);

if(choice==1){

cout<<"Your companion is so impressed by the act. This might be the perfect time" <<endl

<<"to tell that you are the illegitimate grandchild of Wilhelm Caetel, a Nazi general"<<endl

<<"still looking for revenge for his execution" <<endl;

// Another input after an outcome to spice thing up

do{

cout<<"1. Say it"<<endl

<<"2. Joke about Hitler's mustache"<<endl

<<"What do you do?"; cin>>choice;

}while(choice<1 && choice>2);

if(choice==1){

cout<<"You've been arrested for a bad joke gone wrong." <<endl;cin.get();

}

else{

cout<<"You stick it in later that night." <<endl;cin.get();

}

}

else{

if((counter+1)%2==0){

cout<<"You companion finds the joke disrespectful towards the victims of the tragedy." <<endl

<<"You are left alone in the museum" <<endl

<<"the pressure of losing your companion overwhelms you and you commit suicide with an old Nazi torturing device." <<endl;cin.get();

}

else{

cout<<"Your companion laughs loudly towards the joke and admits as the illegitimate grandchild of" <<endl

<<"Dr. Carl Claumberg, a Nazi scientist who cruelly experimented artificial insemination on prisoners." <<endl

<<"You later stick it in." <<endl;cin.get();

}

}

}

void set3(int choice, int counter){

cout<<endl <<"You're stuck under a bus stop to wait for the rain to pass on your way home." <<endl

<<"You see a familiar face beside you but you can't really recall the name."<<endl

<<"You try to talk but words won't come out, you're nervous, choking, vomit on your sweater, mom's spaghetti.."<<endl

<<"He says hi and ask if you're ok."<<endl

<<"1. Nod decisively"<<endl

<<"2. talk" <<endl;

do{

cout<<"What do you do? "; cin>>choice;

}while(choice<1 || choice>2);

if(choice==1){

cout<<"He's still unsure of your answer and decides to offer you a drink" <<endl

<<"1. Accept"<<endl

<<"2. Refuse"<<endl;

do{

cout<<"What do you do? "; cin>>choice;

}while(choice<1 || choice>2);

if(choice==1){

if((counter+1)%2==0){

cout<<"The drink was drugged, you were robbed..." <<endl;cin.get();

}

else{

cout<<"The drink comes out of the spot you least expected, but you still enjoy it" <<endl;cin.get();

}

}

else{

cout<<"Good, you remember what your parents taught you about accepting thing from strangers."<<endl;

}

}

else{

cout<<"You have nothing to talk about, the rain passed and the section is abandoned" <<endl;

}

cout<<endl<<"You are stuck in an old castle with long branching hallways." <<endl

<<"You encounter the first split. Turn (1)left / (2)right: ";

do{

cin>>choice;

if(choice!=1 || choice!=2){

cout<<"Try again. ";

}

}while(choice<1 || choice>2);

if(choice==1){

if((counter+1)%2==0){

cout<<"You encounter a big treasure chest with a lock on it."<<endl

<<"1. Open it with your sword"<<endl

<<"2. Open it with your bare hands"<<endl

<<"What do you do? ";

do{

cin>>choice;

if(choice!=1 || choice!=2){

cout<<"Try again. ";

}

}while(choice<1 || choice>2);

if(choice==1){

cout<<"You don't have a sword, I knew it was dangerous to go alone!" <<endl

<<"Open it with your bare hands(2)? ";

do{

cin>>choice;

if(choice!=2){

cout<<"You can do nothing else. Use hands(2)? ";

}

}while(choice!=2);

cout<<"The treasure chest is a carnivorous demon in camouflage, you've been eaten alive..."<<endl

<<"Thanks for playing."<<endl;

}

else{

cout<<"It's unlocked, the padlock was just for show, you obtained banana."<<endl

<<" A wild Armored Ape has appeared."<<endl

<<"1. Give banana"<<endl

<<"2. Draw your sword"<<endl

<<"What do you do? ";

do{

cin>>choice;

}while(choice<1 || choice>2);

if(choice==2){

cout<<"You don't have a sword. Give banana(1)? ";

do{

cin>>choice;

if(choice!=1){

cout<<"You can do nothing else. Give banana(1)? "<<endl;

}

}while(choice!=1);

cout<<"It takes the banana and plucks your eyeballs with it. It prefers your eyeballs"<<endl

<<"You're stuck bumbling around the castle halls for the rest of your pathetic life."<<endl

<<"Thanks for playing"<<endl;

}

else{

cout<<"It takes the banana and eats it."<<endl

<<"It proceeds to eat your face since you are wearing a banana costume."<<endl

<<"Thanks for playing"<<endl

<<"BTW, Bananas are chom-choms"<<endl;

}

}

}

}

else{

cout<<"You encounter a giant gate with BIG BOSS written on it."<<endl

<<"1. Open the gate"<<endl

<<"2. Save your data"<<endl

<<"What do you do? ";

do{

cin>>choice;

if(choice==2){

//Give illustion of choice to the player

cout<<"This game doesn't support saving. Open the gate(1)? ";

}

if(choice!=1){

cout<<"Try again. ";

}

}while(choice!=1);

cout<<"You encounter a giant robot shaped like an egg with spiky arms."<<endl

<<"1. Jump on its head 10 times"<<endl

<<"2. Draw your sword"<<endl

<<"What do you do? ";

do{

cin>>choice;

}while(choice<1 || choice>2);

if(choice==1){

cout<<"The robot has been wrecked."<<endl

<<"You see a sign saying the princess is in another castle"<<endl

<<"You see no other means of going out. You're stuck forever."<<endl

<<"Thanks for playing"<<endl;

}

else{

cout<<"You don't have a sword."<<endl

<<"Start bopping its head 10 times(1)? ";

do{

cin>>choice;

if(choice!=1){

cout<<"You can do nothing else"<<endl;

}

}while(choice!=1);

cout<<"You took too long and the robot smashed your face in."<<endl

<<"Thanks for playing"<<endl;

}

}

}