// 16Sary Progrms Secnd Asingment.cpp : Defines the entry point for the console application.

//

#include "stdafx.h"

#include "iostream"

using namespace std;

int main()

{

int PriOpraSelector = 2, SecOpraSelector = 20;

do{

if (SecOpraSelector == 20)

{

cout << " List of Programs" << endl;

cout << " To exit whole program enter '0'." << endl << endl;

cout << " Or enter any number to rum that program" << endl;

cout << "1) Fill Triangle 2) Empty Box 3) Empty Triangle" << endl;

cout << "4) Empty Right Triangle 5) Fill Dimond 6) Bottom Half Dimond" << endl;

cout << "7) Empty Dimond 8) 1/1! + 1/2! + 1/3! Sum 9) 1/2 - 3/4 + 5/6 Sum" << endl;

cout << "10) 1 + 1/11 + 1/21 Sum 11) 2 6 11 10 15 21 Series 12) Box having Numbers" << endl;

cout << " 13) Plinomial Series Sum 14) 1 + (1+2) + (1+2+3) Sum" << endl;

cout << " 15) Sum, Product and Average of 1 to 50" << endl << endl;

}

if (SecOpraSelector != 1)

{

cout << endl << endl;

cout << " Enter here the number = ";

cin >> PriOpraSelector;

while (PriOpraSelector < 0 || PriOpraSelector > 15)

{

cout << endl << "Enter a number from '0' to '15'" << endl;

cout << " Enter here the number = ";

cin >> PriOpraSelector;

}

}

if (PriOpraSelector == 1) // Main Opration Selector

{

int length, i = 0, j = 0, spacer, SpacerHelper, stars, StarsHelper; //Fill Triangle

cout << "Enter the length = ";

cin >> length;

for (; length < 0;)

{

cout << "Length never be -ve. Enter a Positive number." << endl;

cout << "Enter the length = ";

cin >> length;

}

while (j <= length)

{

SpacerHelper = 0;

StarsHelper = 0;

spacer = (length - j) \* 2;

stars = 2 \* (j - 1) + j;

while (SpacerHelper < spacer)

{

cout << " ";

SpacerHelper++;

}

while (StarsHelper < stars)

{

cout << "\* ";

StarsHelper++;

}

cout << endl;

j++;

}

cout << endl;

cout << "Remember that the entered length is the height of the triangle.";

}

else if (PriOpraSelector == 2) // Main Opration Selector

{

int length, width, a = 1, b; //Empty Box

do{

cout << "Enter the length of the box(+ve number) = ";

cin >> length;

} while (length < 0);

do{

cout << "Enter the width of the box(+ve number) = ";

cin >> width;

} while (width < 0);

while (a <= width)

{

b = 1;

while (b <= length)

{

if (a == 1 || a == width || b == 1 || b == length)

{

cout << "\* ";

}

else

{

cout << " ";

}

b++;

}

a++;

cout << endl;

}

}

else if (PriOpraSelector == 3) // Main Opration Selector

{

int length, j = 1, spacer1, spacer2, SpacerHelper1, SpacerHelper2; //Empty Triangle

do{

cout << "Enter the length of the the triangle = ";

cin >> length;

if (length % 2 == 0)

{

cout << "Enter an odd number." << endl;

}

if (length < 0)

{

cout << "Length can never -ve.Enter an +ve number." << endl;

}

} while (!(length % 2 == 1) || length < 0);

while (j <= length - 1)

{

spacer1 = length - j;

spacer2 = j \* 2 - 3;

SpacerHelper1 = 1;

SpacerHelper2 = 1;

if (j % 2 != 0)

{

while (SpacerHelper1 <= spacer1)

{

cout << " ";

SpacerHelper1++;

}

if (j != 1)

{

cout << "\* ";

}

while (SpacerHelper2 <= spacer2)

{

cout << " ";

SpacerHelper2++;

}

cout << "\* ";

}

cout << endl;

j++;

}

length = length + length - 1;

j = 1;

while (j <= length)

{

cout << "\* ";

j++;

}

cout << endl << "Remember that the length entered is the height of that triangle.";

cout << " 3 ";

}

else if (PriOpraSelector == 4) // Main Opration Selector

{

int length, i, j = 1; //Empty Right Triangle

cout << "Enter the length" << endl;

cout << "(Note that base and perpendicular have same length). = ";

cin >> length;

for (; length < 0;)

{

cout << "Enter the length. Enter a positive number. = " << endl;

cin >> length;

}

for (; j <= length;)

{

i = 1;

for (; i <= length;)

{

if (j == length || i == 1 || i == j)

{

cout << "\* ";

}

else

{

cout << " ";

}

i++;

}

cout << endl;

j++;

}

}

else if (PriOpraSelector == 5) // Main Opration Selector

{

int length, spacer, stars; //Fill Domond

do{

cout << "Enter the length of the dimond. = ";

cin >> length;

if (length < 0)

{

cout << "Length can never be zero." << endl;

}

} while (length < 0);

for (int j = 1; j <= length; j++)

{

spacer = length - j;

stars = 2 \* j - 1;

for (int a = 1; a <= spacer; a++)

{

cout << " ";

}

for (int a = 1; a <= stars; a++)

{

cout << "\* ";

}

cout << endl;

}

length = length - 1;

for (int j = 1; j <= length; j++)

{

spacer = j;

stars = (length - j) \* 2 + 1;

for (int a = 1; a <= spacer; a++)

{

cout << " ";

}

for (int a = 1; a <= stars; a++)

{

cout << "\* ";

}

cout << endl;

}

cout << endl << "Remember that the length entered is the length of dimond from its center to its any corner.";

}

else if (PriOpraSelector == 6) // Main Opration Selector

{

int input, spacer, j = 0, stars, SpacerHelper, StarsHelper;

do{

cout << "Enter the length = ";

cin >> input;

if (input < 0)

{

cout << "Length can never be zero." << endl;

}

} while (input < 0);

input = input - 1;

do{

spacer = j - 1;

stars = (input - j) \* 2;

StarsHelper = 0;

SpacerHelper = 0;

while (SpacerHelper <= spacer)

{

cout << " ";

SpacerHelper++;

}

while (StarsHelper <= stars)

{

cout << "\* ";

StarsHelper++;

}

cout << endl;

j++;

} while (j <= input);

cout << endl;

cout << "Note that the entered length is the height of the triangle.";

}

else if (PriOpraSelector == 7) // Main Opration Selector

{

int length, j = 1, spacer1, spacer2, SpacerHelper1, SpacerHelper2; //Empty Dimond

do{

cout << "Enter the length. = ";

cin >> length;

if (length < 0)

{

cout << "Length can never be zero." << endl;

}

} while (length < 0);

if (length != 0)

{

do{

spacer1 = length - j;

spacer2 = j \* 2 - 3;

SpacerHelper1 = 1;

SpacerHelper2 = 1;

if (j != length)

{

do

{

cout << " ";

SpacerHelper1++;

} while (SpacerHelper1 <= spacer1);

}

cout << "\* ";

if (j != 1)

{

do{

cout << " ";

SpacerHelper2++;

} while (SpacerHelper2 <= spacer2);

cout << "\* ";

}

cout << endl;

j++;

} while (j <= length);

if (length != 1)

{

j = 1;

length = length - 1;

do{

spacer1 = j;

spacer2 = (length - j) \* 2 - 1;

SpacerHelper1 = 1;

SpacerHelper2 = 1;

do

{

cout << " ";

SpacerHelper1++;

} while (SpacerHelper1 <= spacer1);

cout << "\* ";

if (j != length)

{

do{

cout << " ";

SpacerHelper2++;

} while (SpacerHelper2 <= spacer2);

cout << "\* ";

}

cout << endl;

j++;

} while (j <= length);

}

cout << "Remember that the length entered is length of dimond from its center to its any corner.";

}

}

else if (PriOpraSelector == 8) // Main Opration Selector

{

int limit, a = 1, FactorialDecriser; //1/1! + 1/2! +1/3! sum

double factorial;

float sum = 0;

do{

cout << "Enter the limit of the series = ";

cin >> limit;

if (limit < 0)

{

cout << "Enter a positive number." << endl;

}

} while (limit < 0);

cout << endl;

cout << "The sum of series " << endl;

while (a < limit)

{

cout << "1/" << a << "!" << " + ";

FactorialDecriser = a;

factorial = 1;

while (FactorialDecriser != 1)

{

factorial = factorial \* FactorialDecriser;

FactorialDecriser = FactorialDecriser - 1;

}

sum = sum + (1 / factorial);

a++;

}

cout << "1/" << a << "!";

FactorialDecriser = a;

factorial = 1;

while (FactorialDecriser != 1)

{

factorial = factorial \* FactorialDecriser;

FactorialDecriser = FactorialDecriser - 1;

}

sum = sum + (1 / factorial);

cout << " = " << sum;

}

else if (PriOpraSelector == 9) // Main Opration Selector

{

int range; //1/2 - 3/4 + 5/6 Sum

float a = -1, b = 0, sum = 0;

do{

cout << "Enter the range . = ";

cin >> range;

if (range != 0)

{

cout << "Enter an even number number" << endl;

}

if (range < 0)

{

cout << "Enter a positive number." << endl;

}

} while (range % 2 != 0 || range < 0);

cout << endl << " The sum of the series" << endl << " ";

while (b < range)

{

a = a + 2;

b = b + 2;

if (b <= range)

{

cout << a << "/" << b;

sum = sum + a / b;

}

a = a + 2;

b = b + 2;

if (b <= range)

{

cout << " - " << a << "/" << b << " + ";

sum = sum - a / b;

}

}

cout << " is = ";

cout << sum;

}

else if (PriOpraSelector == 10) // Main Opration Selector

{

int range; //1 + 1/11 + 1/21 Sum

float sum = 0.0, a = 1.0;

do{

cout << "Enter the range(enter number of 1, 11, 21, 31 type). = ";

cin >> range;

} while ((range - 1) % 10 != 0 && range != 0);

cout << endl << " The sum of the following series" << endl << " ";

if (range > 0)

{

while (a < range)

{

cout << "1/" << a << "+";

sum = sum + 1 / a;

a = a + 10.0;

}

cout << "1/" << a;

sum = sum + 1 / a;

}

cout << endl << " is = " << sum;

}

else if (PriOpraSelector == 11) // Main Opration Selector

{

int range, a = 1, n1 = 8, n2 = 9, n3 = 10; //2 6 11 10 15 21 18 Series

do{

cout << "Enter the range of the series. = ";

cin >> range;

if (range < 0)

{

cout << "Enter a positive number" << endl;

}

} while (range < 0);

cout << endl << " The series is" << endl << " ";

while (a < range)

{

if (n1 <= range)

{

cout << n1 << " ";

}

if (n2 <= range)

{

cout << n2 << " ";

}

if (n3 <= range)

{

cout << n3 << " ";

}

n1 = n1 + 8;

n2 = n2 + 9;

n3 = n3 + 10;

a = a + 11;

}

}

else if (PriOpraSelector == 12) // Main Opration Selector

{

int number, length, width, a = 1, b, MidPoint; //Box having numbers

do{

cout << "Enter the length(enter a odd number) = ";

cin >> length;

} while (length % 2 == 0);

cout << "Enter the width = ";

cin >> width;

MidPoint = length / 2 + 1;

while (a <= width)

{

b = 1;

number = a \* 10 - 10;

while (b <= length)

{

if (b / MidPoint != 0 && b % MidPoint != 0)

{

number = number - 10;

}

else

{

number = number + 10;

}

cout << number << " ";

b++;

}

cout << endl;

a++;

}

}

else if (PriOpraSelector == 13) // Main Opration Selector

{

int base, power, coefficient, a = 1; //Polinomial Series Sum

double sum = 0;

cout << "Enter the value of base. = ";

cin >> base;

cout << "Enter the value of maximum power = ";

cin >> power;

cout << "Enter the value of coefficient. = ";

cin >> coefficient;

cout << endl << "The sum of the series " << endl << " ";

while (a < power)

{

cout << coefficient << "(" << base << ")^" << a;

if (a % 2 != 0)

{

cout << " - ";

sum = sum + coefficient \* pow(base, a);

}

else

{

cout << " + ";

sum = sum - coefficient \* pow(base, a);

}

a++;

}

cout << coefficient << "\*" << "(" << base << ")^" << a;

if (a % 2 != 0)

{

sum = sum + coefficient \* pow(base, a);

}

else

{

sum = sum - coefficient \* pow(base, a);

}

cout << endl << endl;

cout << " is = " << sum;

}

else if (PriOpraSelector == 14) // Main Opration Selector

{

int range, sum = 0, a = 1, b; //1 + (1+2) + (1+2+3) Sum

cout << "Enter the maximum point. = ";

cin >> range;

cout << endl << " The sum of series " << endl << " ";

while (a <= range)

{

cout << "(";

b = 1;

while (b < a)

{

cout << b << "+";

sum = sum + b;

b++;

}

cout << b;

sum = sum + b;

cout << ") + ";

a++;

}

cout << endl << " is = " << sum;

}

else if (PriOpraSelector == 15) // Main Opration Selector

{

int sum = 0; //Sum Average and Product of 1 to 50

double product = 1, a = 5.0;

cout << "The sum of series " << endl << endl;

while (a < 50)

{

cout << a << "+";

sum = sum + a;

a = a + 3;

}

cout << "50" << endl;

cout << " is equal to = " << sum + 50 << endl << endl;

cout << "And the average is " << (sum + 50.0) / 50.0 << endl << endl;

cout << "The product of the series " << endl << endl;

a = 5;

while (a < 50)

{

cout << a << "\*";

product = product \* a;

a = a + 3;

}

cout << "50";

cout << endl << " is equal to = " << product \* 50;

}

cout << endl;

if (PriOpraSelector != 0)

{

cout << "To start this program again enter '1'." << endl;

cout << "To see list again enter '20'." << endl;

cout << "Or to close whole program enter '0'." << endl;

cout << " Enter here the number = ";

cin >> SecOpraSelector;

while (SecOpraSelector != 0 && SecOpraSelector != 1 && SecOpraSelector != 20)

{

cout << endl << "Enter 1, 0 or 20." << endl;

cout << " Enter here the number = ";

cin >> SecOpraSelector;

}

if (SecOpraSelector == 0)

{

PriOpraSelector = 0;

}

}

cout << endl << endl;

} while (PriOpraSelector != 0 && SecOpraSelector != 0);

return 0;

}