#include "string.h"

#include "math.h"

#include "stdio.h"

#include "stdlib.h"

#pragma warning(disable : 4996)

double Function(double x);

double FindMax(double a, double b, double step);

double FindMin(double a, double b, double step);

char\* FromDoubleToString(double x);

int main()

{

char filename[256] = { '\0' };

strcat(filename, "output.txt");

char console[30][84];

int i;

int j;

int countXfile;

int countYfile;

double valueYfile;

double valueXfile;

double valueXconsole;

double valueYconsole;

double a;

int l;

double b;

double x;

double Y;

int countXconsole;

int countYconsole;

for (i = 0; i < 30; i++)

{

for (j = 0; j < 83; j++)

{

console[i][j] = ' ';

}

}

for (i = 0; i < 30; i++)

{

console[i][83] = '\0';

}

for (i = 1; i < 30; i++)

{

console[i][41] = (char)179;

}

for (i = 0; i < 82; i++)

{

console[12][i] = (char)196;

}

console[12][41] = (char)197;

a = -1 \* (2 \* atan(1));

b = 2 \* atan(1);

valueXconsole = (b - a) / 78;//цена деления

valueYconsole = (FindMax(a, b, valueXconsole)

- FindMin(a, b, valueXconsole)) / 25;

x = a;

while (x <= b)

{

Y = Function(x);

countXconsole = round(x / valueXconsole);

countYconsole = round(Y / valueYconsole);

console[12 - countYconsole][41 + countXconsole] = '\*';

x += valueXconsole;

}

console[0][39] = 'y';

console[0][41] = '^';

console[12][81] = '>';

console[12][82] = 'x';

console[11][38] = '0';

for (i = 0; i < 25; i++)

{

printf("%s\n", console[i]);

}// заканчивается работа с выводом графика на экран

char file[65][110];//массив

valueXfile = (b - a) / 60;

valueYfile = (FindMax(a, b, valueXfile) - FindMin(a,

b, valueXfile)) / 80;

for (i = 0; i < 65; i++)

{

for (j = 0; j < 85; j++)

{

file[i][j] = ' ';

}

}

for (i = 0; i < 65; i++)

{

file[i][85] = '\0';

}

for (i = 0; i < 65; i++)

{

file[i][50] = 'I';

}

x = a;

while (x <= b)

{

double Y = Function(x);

countXfile = round(x / valueXfile);

countYfile = round(Y / valueYfile);

char\* s = FromDoubleToString(Y);

if (countYfile > 0)

{

for (i = 1; i <= countYfile + 1; i++)

file[30 - countXfile][50 + i] = '|';

if ((50 + countYfile + strlen(s)) < 95)

{

int j = 0;

for (i = countYfile + 1; i < countYfile + 1 + strlen(s);

i++)

{

file[30 - countXfile][50 + i] = s[j];

j++;

}

}

else

{

for (i = 0; i < strlen(s); i++)

{

file[30 - countXfile][94 - strlen(s) + i] = s[i];

}

}

file[30 - countXfile][50 + countYfile + 6] = '\0';

}

else

{

for (i = -1; i >= countYfile - 1; i--)

file[30 - countXfile][50 + i] = '|';

l = (50 + countYfile - strlen(s));

if (l > 0)

{

int j = 0;

for (i = countYfile - 1; i >= countYfile - strlen(s);

i--)

{

file[30 - countXfile][50 + i] = s[strlen(s)

- 1 - j];

j++;

}

}

else

{

for (i = 0; i < strlen(s); i++)

{

file[30 - countXfile][i] = s[i];

}

}

}

if (countXfile == 0)

{

for (i = 0; i < 86; i++)

{

file[30][i] = '-';

}

file[30][86] = '>';

file[30][87] = '\0';

}

x += valueXfile;

}

file[30][50] = '+';

FILE\* on;

on = fopen(filename, "wt");

if (on == NULL)

{

printf("file not found or can't be created\n");

return 0;

}

for (i = 0; i < 65; i++)

{

file[i][87] = '\0';

}

for (int i = 0; i < 65; i++)

{

strcat(file[i], "\n");

if (fputs(file[i], on) == EOF)

{

fclose(on);

printf("error of writing\n");

remove(filename);

return 0;

}

}

char\* s = FromDoubleToString(valueYfile);

int m = strlen(s);

char temp1[256] = { 0 };

for (int j = 0; j < m; j++)

{

temp1[j] = s[j];

}

if (fputs(temp1, on) == EOF)

{

fclose(on);

printf("error of writing\n");

remove(filename);

return 0;

}

fputs(" - Масштаб", on);

fclose(on);

return 0;

}

double Function(double x)

{

return 2 \* sin(x) + 3 \* cos(2 \* x);

}

double FindMax(double a, double b, double step)

{

double max;

max = Function(a);

while (a <= b)

{

a += step;

if (Function(a) > max)

max = Function(a);

}

return max;

}

double FindMin(double a, double b, double step)

{

double min;

min = Function(a);

while (a <= b)

{

a += step;

if (Function(a) < min)

min = Function(a);

}

return min;

}

char\* FromDoubleToString(double x)

{

char s[10];

int i = 0;

int count = 0;

int n;

int j = 0;

int l;

double r;

if (x < 0)

{

s[0] = '-';

i++;

x = fabs(x);

}

n = x;

r = x - n;

while (n > 0)

{

l = fmod(n, 10);

s[sizeof(s) - count - 1] = (char)l + 48;

count++;

n /= 10;

}

for (int j = count; j > 0; j--)

{

s[i] = s[sizeof(s) - j];

i++;

}

if (x < 1)

{

s[i] = '0';

i++;

}

if (r != 0)

{

s[i] = '.';

i++;

for ( j = 0; j < 3; j++)

{

int a = r \* 10;

s[i] = (char)a + 48;

r = r \* 10 - a;

i++;

}

}

s[i] = '\0';

return s;

}