演習課題 05 (05月10日）レポート

交換留学(文学部)　ES19-0013 ジョユンサン  
課題 5

基本課題5

*// Created by Jho on 10/0*５*/2019.*

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#include <stdio.h>

#include <stdlib.h>

#include "cglec.h"

**int** LineFunc(**int** x, **int** y, **int** x1, **int** y1, **int** x2, **int** y2)

{

**return** (x2 - x1) \* (y - y1) - (y2 - y1) \* (x - x1); *//*点*(x,y)*が正領域なら正値

}

**void** PaintTriangle(Image img, **int** x1, **int** y1, **int** x2, **int** y2, **int** x3, **int** y3, **int** g)

{

**int** x, y;

**int** Min\_x, Min\_y, Max\_x, Max\_y; *//*クリッピング処理

**if** (x1 >= x2) { Max\_x = x1, Min\_x = x2;}

**else** { Max\_x = x2, Min\_x = x1;}

**if** (x3 > Max\_x)Max\_x = x3;

**if** (x3 < Min\_x)Min\_x = x3;

**if** (y1 >= y2) { Max\_y = y1, Min\_y = y2; }

**else** { Max\_y = y2, Min\_y = y1; }

**if** (y3 > Max\_y)Max\_y = y3;

**if** (y3 < Min\_y)Min\_y = y3;

**if** (LineFunc(x3, y3, x1, y1, x2, y2) > 0) *//*パターン*I(*反時計回り*)*かパターン*II(*時計周り*)*かを判定

{

**for** (x = Min\_x; x < Max\_x; x++)

**for** (y = Min\_y; y < Max\_y; y++)

{

**if** (LineFunc(x, y, x1, y1, x2, y2) > =0 && LineFunc(x, y, x2, y2, x3, y3) >= 0 && LineFunc(x, y, x3, y3, x1, y1) > =0

&& 0 < x&& img.Nx > x && 0 < y&& img.Ny > y)

\* (img.Data + x \* img.Ny + y) = g;

}

}

**else**

{

**for** (x = Min\_x; x < Max\_x; x++)

**for** (y = Min\_y; y < Max\_y; y++)

{

**if** (LineFunc(x, y, x1, y1, x2, y2) <= 0 && LineFunc(x, y, x2, y2, x3, y3) < =0 && LineFunc(x, y, x3, y3, x1, y1) <= 0

&&0<x&&img.Nx>x&&0<y&&img.Ny>y)

\* (img.Data + x \* img.Ny + y) = g;

}

}

}

**int** main(**void**)

{

**int** Nx, Ny;

printf("画像の横向ピクセル数は? "); scanf("%d", &Nx);

printf("画像の縦向ピクセル数は? "); scanf("%d", &Ny);

**unsigned** **char**\* data = (**unsigned** **char**\*)malloc(**sizeof**(**unsigned** **char**) \* Nx \* Ny);

**if** (data == **NULL**)

{

printf("ERROR");

exit(0);

}

Image img = { (**unsigned** **char**\*)data,Nx,Ny};

CglSetAll(img, 0);

PaintTriangle(img, 0, 0, Nx - 1, Ny / 2, 3 \* Nx / 4, Ny - 1, 255);

PaintTriangle(img, Nx / 5, 4 \* Ny / 5, Nx / 5 + Nx, 4 \* Ny / 5, 2 \* Nx / 3, -Ny / 5, 100);

PaintTriangle(img, Nx / 2, Ny / 2, 3 \* Nx / 4, 3 \* Ny / 4, 3 \* Nx / 4, Ny / 2, 180);

PaintTriangle(img, Nx / 2, Ny / 3, Nx / 4, 4 \* Ny / 3, -Nx / 4, Ny / 2, 60);

CglSaveGrayBMP(img, "Triangles.bmp");

free(data);

}





