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

発展課題5

*// Created by Jho on 10/05/2019.*

*// Copyright © 2019 Jho. All rights reserved.*

#include <stdio.h>

#include <stdlib.h>

#include "cglec.h"

**int** d; *//*短辺

**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;

**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 = d/4; x < d/4\*3; x++)

**for** (y =d/4; y < d/4\*3; 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 = d / 4; x < d / 4 \* 3; x++)

**for** (y = d / 4; y < d / 4 \* 3; 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**\* red = (**unsigned** **char**\*)malloc(**sizeof**(**unsigned** **char**) \* Nx \* Ny);

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

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

**if** (red == **NULL**||green==**NULL**||blue==**NULL**)

{

printf("ERROR");

exit(0);

}

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

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

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

CglSetAll(img\_red, 0);

CglSetAll(img\_green, 0);

CglSetAll(img\_blue, 0);

**if** (Nx > Ny) d=Ny;

**else** d = Nx;

PaintTriangle(img\_red, d/4,d/4,d/4\*3,d/4,d/4,d/4\*3,255);

PaintTriangle(img\_green, d / 4, d / 4\*3, d/ 4 \* 3, d / 4, d / 4 \* 3, d / 4 \* 3, 255);

PaintTriangle(img\_blue, d / 4, d / 4, d / 4 \* 3, d / 4, d / 2, d / 4 \* 3, 255);

CglSaveColorBMP(img\_red,img\_green,img\_blue, "Triangles\_color.bmp");

free(red);

free(green);

free(blue);

}

