#include <stdio.h>

#include <iostream>

#include <opencv2/highgui/highgui.hpp>

#include <opencv2/imgproc/imgproc.hpp>

#include <opencv2/core/core.hpp>

using namespace cv;

using namespace std;

int a[3][3] = {-1, 0, 1,-1, 0, 1,-1, 0, 1, }; int b[3][3] = {-1, -1, -1, 0, 0, 0, 1, 1, 1},sum1 = 0, sum2=0, v=0, p=0,G[1300\*1300];

int i, j, k, l;

Mat img = imread("lena.jpg",CV\_LOAD\_IMAGE\_GRAYSCALE);

Mat binary(int G[], int v){

Mat img1(img.rows, img.cols, CV\_8UC1);

int x = 0;

for(i=0; i<img.rows; i++){

for(j=0; j<img.cols; j++){

if(G[x++] < v){

img1.at<uchar>(i,j)= 0;

}else{

img1.at<uchar>(i,j)= 255;

}

}

}return img1;

}

int main(){

cout<<img.rows<< " "<<img.cols;

for(i=0; i<img.rows; i++){

for(j=0; j<img.cols; j++){

for(k=-1; k<=1; k++){

for(l=-1; l<=1; l++){

if(k+i>=0 && l+j<img.cols && k+i<img.rows && j +l>=0){

sum1+= a[k+1][l+1]\*img.at<uchar>(i+k, j+l);

sum2+= b[k+1][l+1]\*img.at<uchar>(i+k, j+l);

}}}

G[p] = abs(sum1) + abs(sum2);

p++;

sum1=0;

sum2=0;

}}

namedWindow("lena",WINDOW\_NORMAL);

createTrackbar("t","lena", &v, 255);

while(1){

imshow("lena", binary(G, v));

Mat img2(img.rows, img.cols, CV\_8UC1);

img2 = binary(G, v);

int q = 0;

for(i=0; i<img.rows; i++){

for(j=0; j<img.cols; j++){

for(k=-1; k<=1; k++){

for(l=-1; l<=1; l++){

if(img2.at<uchar>(i+k,j+l) == 0){

img2.at<uchar>(i,j) = 0;

}else {img2.at<uchar>(i,j) = 255;}

}}}}

for(i=0; i<img.rows; i++){

for(j=0; j<img.cols; j++){

for(k=-1; k<=1; k++){

for(l=-1; l<=1; l++){

if(img2.at<uchar>(i+k,j+l)== 255){

img2.at<uchar>(i,j) = 255;

}else {img2.at<uchar>(i,j) = 0;}

}}}}

imshow("lena",img2);

waitKey(100);

}

}