#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;

float a[3][3] = {1/16.0, 1/8.0, 1/16.0, 1/8.0, 1/4.0, 1/8.0, 1/16.0, 1/8.0, 1/16.0},sum1 = 0, sum2 = 0, sum3 = 0, g=0, avg1, avg2, avg3;

int i, j, k, l;

int main(){

Mat img = imread("lena.jpg");

Mat img2(img.rows, img.cols, CV\_8UC3, Scalar(255,255,255));

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

sum1+= a[k+1][l+1]\*img.at<Vec3b>(i+k, j+l)[0];

sum2+= a[k+1][l+1]\*img.at<Vec3b>(i+k, j+l)[1];

sum3+= a[k+1][l+1]\*img.at<Vec3b>(i+k, j+l)[2];

g+=a[k+1][l+1];

}

}

}

avg1= sum1/g; avg2= sum2/g; avg3= sum3/g;

img2.at<Vec3b>(i, j)[0] =(int)avg1;

img2.at<Vec3b>(i, j)[1] = (int)avg2;

img2.at<Vec3b>(i, j)[2] = (int)avg3;

g=0;

sum1=0;

sum2=0;

sum3=0;

}

}

imshow("lena", img2); imshow("lena2", img);

waitKey(0);

}