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% NAME: SHRIRANG ALIAS SAMARTH PATIL
% REG.NO.: 19BAI10079
% Harris Corner Detection
img = imread('box.jpg');
if length(size (img))>2
    img = rgb2gray(img);
end

%applying sobel edge detector in the horizontal detection
fx = [-1 0 1;-1 0 1; -1 0 1];
Ix = filter2(fx,img);

%applying sobel edge detector in the vertical direction
fy = [1 1 1;0 0 0;-1 -1 -1];
Iy = filter2(fy,img);
Ix2 = Ix.^2;
Iy2 = Iy.^2;
Ixy = Ix.*Iy;
clear Ix;
clear Iy;

%applying gaussian filter on the computed value
h= fspecial ('gaussian', [7 7],2);
Ix2 = filter2(h,Ix2);
Iy2 = filter2(h,Iy2);
Ixy = filter2(h,Ixy);
height = size(img,1);
width = size(img,2);
result = zeros (height,width);
R = zeros (height, width);
Rmax = 0;
for i = 1:height
    for j = 1:width
M = [Ix2(i,j) Ixy(i,j); Ixy(i,j) Iy2(i,j)];
R(i,j) = det(M)-0.01*(trace(M))^2;
        if R(i,j) > Rmax
            Rmax = R(i,j);
        end
    end
end

cnt = 0;
for i = 2:height-1
    for j = 2:width-1
        if R(i,j) > 0.1*Rmax && R(i,j) > R(i-1,j-1) && R(i,j) > R(i-1,j) && R(i,j) > R(
            result(i,j) = 1;
            cnt = cnt+1;
        end
    end
end

[posc, posr] = find(result == 1);
cnt ;
```

```
figure
imshow(img);
hold on;
plot(posr,posc,'r.');
```