CSE 344: Computer Vision

Homework 6 ; Arka Sarkar 2018222

Question 1

Matlab Code :

```
a = [1 9 9; 1 9 9; 1 1 1];
I_x = conv2(a,[1 -1], "same")
I_y = conv2(a,[1 ;-1], "same")
M = [sum(sum(I_x.^2)), sum(sum(I_x.*I_y));sum(sum(I_x.*I_y)), sum(sum(I_y.^2))]
det_M = det(M)
```

Covariance Matrix (M) :

291	73
73	131

Determinant **:** 32792

Question 2

Eigen values for M are : 102.6995, 319.3005

Sum = 422

Question 3

R using harris method = 102.6995*319.3005 - 0.04*(102.6995 + 319.3005)**2 = 25669

Question 4

R using Shi-Thomsi = min(102.6995 , 319.3005) = 102.6995

Question 5

As we apply gaussian filters on a image 3 times on multiple scales the , the number of keypoints will decrease hence the numeric values of the pixels would be closer. Hence the variance of the resultant image will decrease.

Question 6

DoGs stands for Difference of Gaussians which is difference of consecutive gaussians having different scales, it is used to find key points using SIFT method.