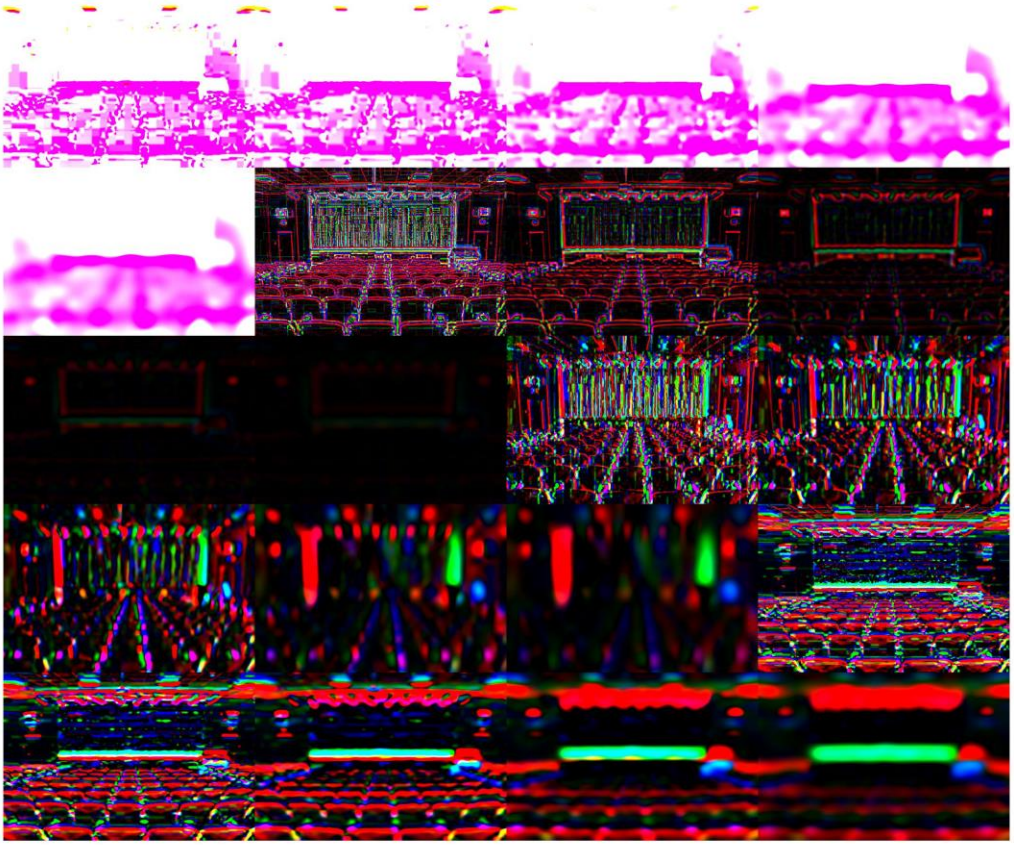
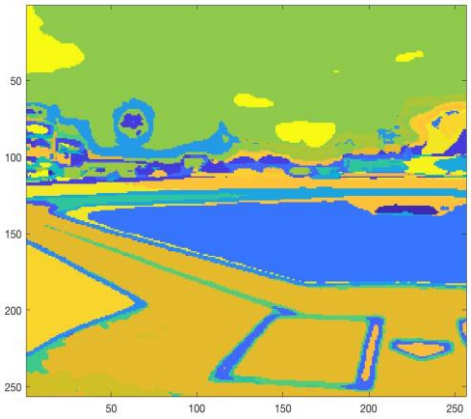
Q 1.0

Category 1: Gaussian – Used to remove noise and blur the image
Category 2: Laplace of Gaussion – Used to detect edges and change in gradients in all directions.
Category 3: Directional derivative in x-direction – Used to detect edges or change in gradient in horizontal directions
Category 4: Directional derivative in y-direction – Used to detect edges or change in gradient in vertical direction

Q 1.2



Q 1.3


50
100
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250
50
100
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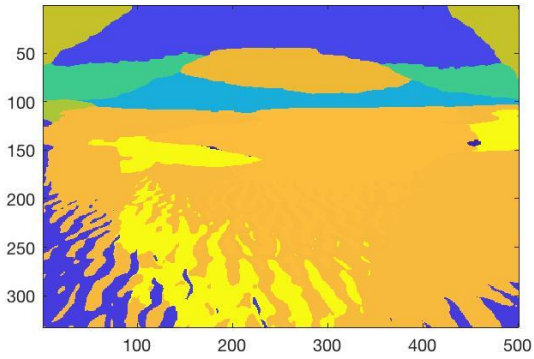
250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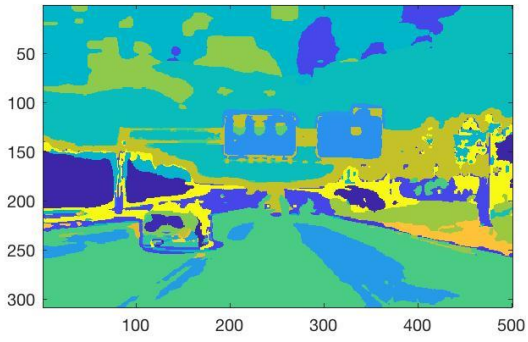
Winston-Salem
Charlotte
Greensboro
Asheboro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Q 2.5

Confusion Matrix:

13	0	1	1	1	2	2	0
1	9	1	5	0	0	0	4
1	1	9	4	2	2	0	1
1	1	0	11	1	0	1	5
3	1	1	0	13	2	0	0
6	0	0	0	5	8	1	0
1	0	0	1	0	1	14	3
0	1	1	5	1	1	2	9

Accuracy:

53.75%

Q 2.6

Class with the least accuracy was ‘laundaromat’. Reason can be that it’s difficult to get the features when there is a lot of intra-class variation. The washing machines were of different shapes and sizes. Further, images were taken from different angles.

‘Baseball field’ and ‘deserts‘ also showed low accuracy. Reason can be the texture which was there in both classes.

Q 3.2

Evaluating deep feature extraction part was very slow in my local machine. It was taking about 15 mins for each image. As such, I was not able complete the testing for all the 160 images. Below are the results for a test set of 10 images:

2	0	0	0	0	0	0	0
0	2	1	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	2	0	0	0	0
0	0	0	0	2	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Although size of 10 is too small to predict, but still it accuracy was 90% as per this.