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Q1.
Ref:

1. Image Indexing Using Color Correlograms
2. https://github.com/enthalpy-yan/Color-Texture-Shape

The paper and its formula were used to identify the $Gamma_{Ci}$ value for the same colors and further used to calculate the distance between the images.
I was not able to cluster the color into smaller bins (due to time constraint) which would have reduced the distance calculation time.
The precision and recall for some queries were calculated and others can be shown as and when required. (each query takes about 15 minutes to run)
The images have been reduced to 15% of their original size.

1. For HW-1/train/query/all_souls_3_query.txt

   Truth Type: good
   Precision: 0.009009009009009009
   Recall: 0.041666666666666664

   Truth Type: ok
   Precision: 0.0
   Recall: 0.0

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

2. For HW-1/train/query/all_souls_1_query.txt

   Truth Type: good
   Precision: 0.009009009009009009
   Recall: 0.041666666666666664

   Truth Type: ok
   Precision: 0.0
   Recall: 0.0

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

3. For HW-1/train/query/balliol_2_query.txt

   Truth Type: good
   Precision: 0.0
   Recall: 0.0

   Truth Type: ok
   Precision: 0.05555555555555555
   Recall: 0.14285714285714285

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

4. For HW-1/train/query/ashmolean_2_query.txt

   Truth Type: good
   Precision: 0.03225806451612903
   Recall: 0.08333333333333333

   Truth Type: ok
   Precision: 0.0
   Recall: 0.0

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

5. For HW-1/train/query/ashmolean_3_query.txt

   Truth Type: good
   Precision: 0.0
   Recall: 0.0

   Truth Type: ok
   Precision: 0.03225806451612903
   Recall: 0.07692307692307693

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

6. For HW-1/train/query/balliol_3_query.txt

   Truth Type: good
   Precision: 0.0
   Recall: 0.0

   Truth Type: ok
   Precision: 0.05555555555555555
   Recall: 0.14285714285714285

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

7. For HW-1/train/query/balliol_1_query.txt

   Truth Type: good
   Precision: 0.05555555555555555
   Recall: 0.2

   Truth Type: ok
   Precision: 0.0
   Recall: 0.0

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

8. For HW-1/train/query/bodleian_3_query.txt

   Truth Type: good
   Precision: 0.03333333333333333
   Recall: 0.07692307692307693

   Truth Type: ok
   Precision: 0.0
   Recall: 0.0

   Truth Type: junk
   Precision: 0.0
   Recall: 0.0

9. For HW-1/train/query/ashmolean_1_query.txt

Truth Type: good
Precision: 0.03225806451612903
Recall: 0.08333333333333333

Truth Type: ok
Precision: 0.0
Recall: 0.0

Truth Type: junk
Precision : 0.0
Recall : 0.0

Due to lack of time, all the precision and recall were not able to be calculated. The average time for each retrieval is 15 minutes. This can be reduced by **clustering** the unique colors (which were around 51L) into a smaller bin set.

Q2.
Ref: Spatial Filters - Laplacian/Laplacian of Gaussian
Ref: https://github.com/n-k-chilagani/cv-assignment1

1. Laplacian of gaussian is calculated with 9 filter layers, each one scaled to a different value.
    a. These layers are used to get the blobs in the image.
2. Each blob is found by obtaining the pixels which have the largest value in the surrounding 3D cuboid area.

The images have been reduced to 15% of their original size.
Example: (*ashmolean 7*)