Project 2: Content based image retrieval project report

Introduction: As part of this project, and content based image retrieval system is developed. Various similarity metrics were discussed during class to match the images from database with the target images. For this project, histogram intersection distance is used to find similar images.

Learnings: I learned to build image histograms and use histogram similarity metrics as a similarity measure.

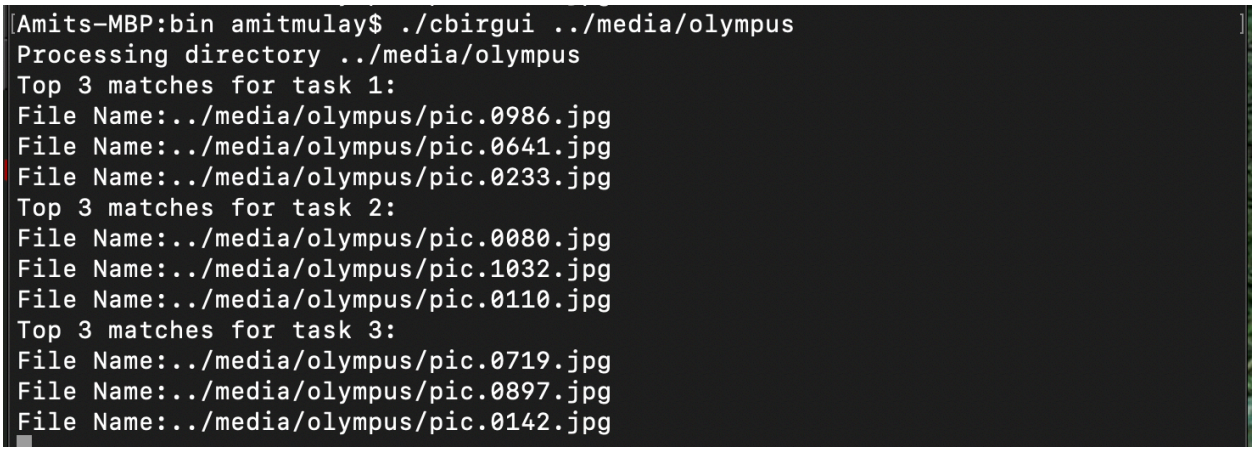
Extension: I developed a simple GUI to select tasks, display target images and display number matches for the target images to make the interaction convenient and easy to use.

Build instruction:
Use CMakeList.txt to generate make file.

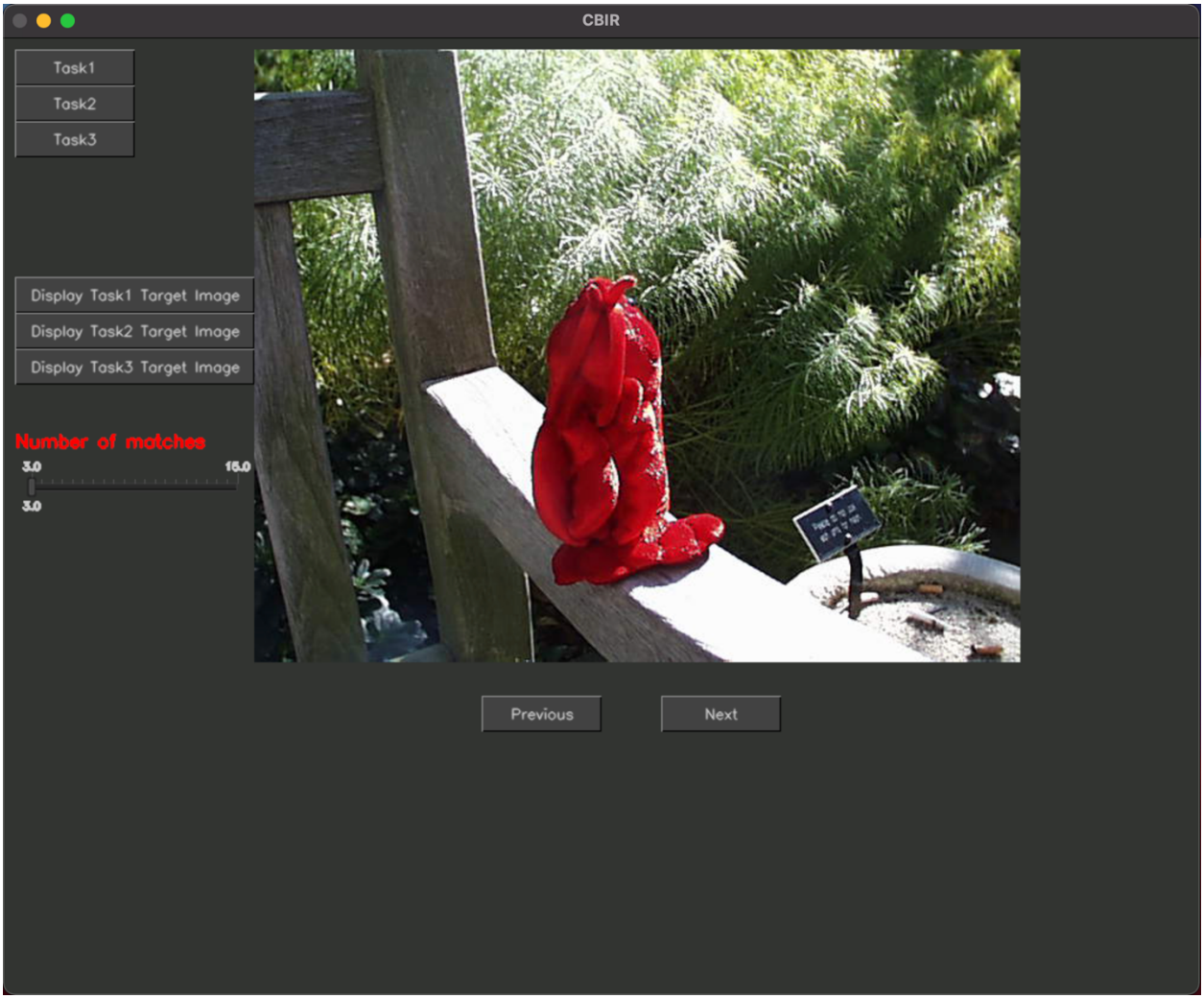
Execution:
./AppName image_database_path

./cbirgui ../media/olympus

Output on console and GUI: Top matched file names are displayed on console and images are rendered in a window.



GUI:



Button functionality:
Task1 -> Execute task 1 and render 1st match on screen.
Task2 -> Execute task 2 and render 1st match on screen.
Task3 -> Execute task 3 and render 1st match on screen.

Display Task Target Image -> Render respective target image selected for that particular task.

Select Matches trackbar -> Select number of matches to be displayed in matching order. (Default is set to 3 and max is 15)

Next -> Display next match
Previous -> Display previous match

Task 1: Use the 9x9 square in the middle of the image as a feature vector. Use sum-of-squared-difference as the distance metric:

Target image:

1st Match:

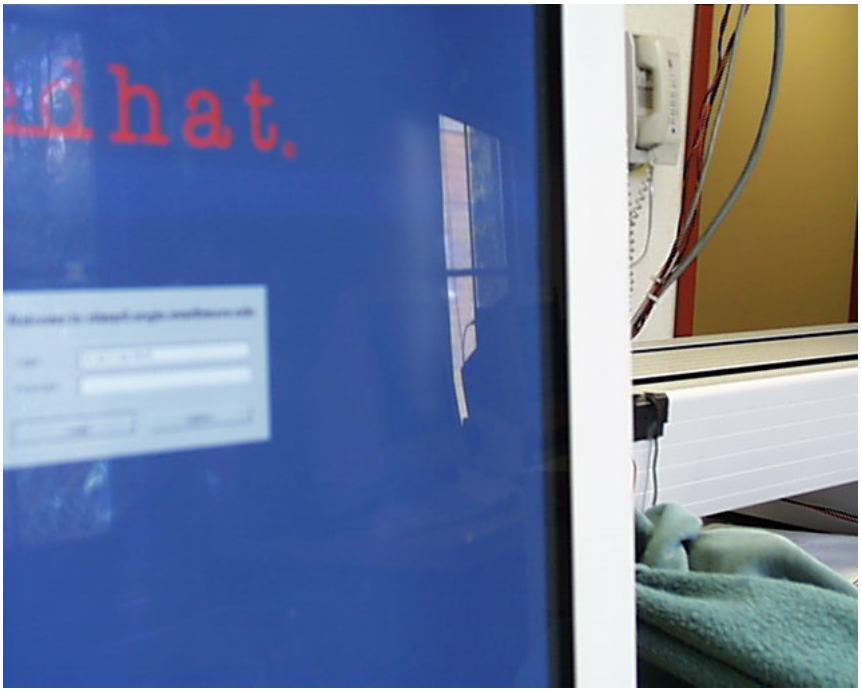
2nd Match:

3rd Match:

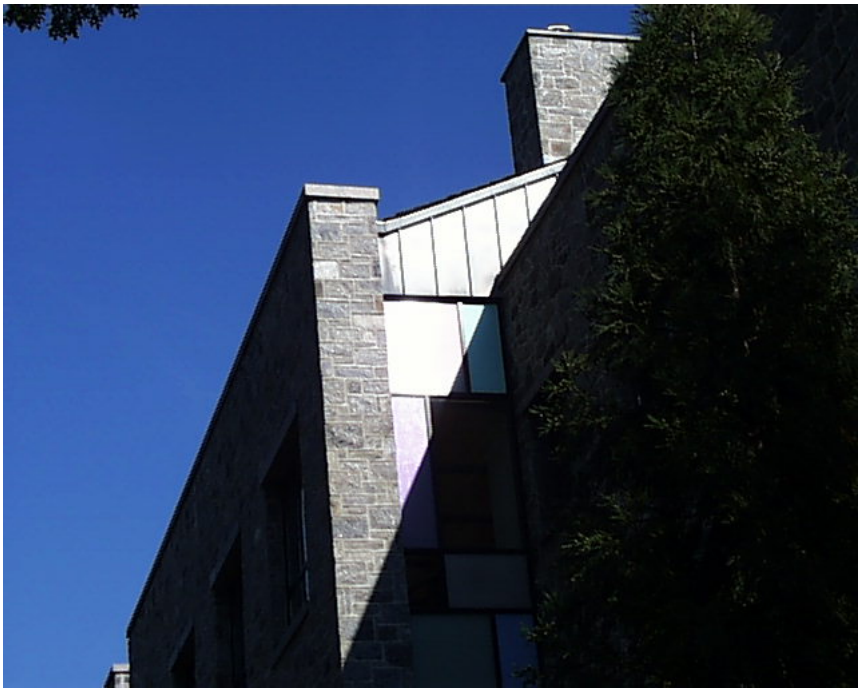
Task 2: Histogram matching: Used whole image histogram with 16 bin size.

Target Image:

1st Match:



2nd Match:



3rd Match:

Task3: Multi-histogram matching: Used 1 whole image and 1 center 100 x 100 image patch histogram.

Target Image:

1st Match:

2nd Match:

3rd Match: