BigHW Report

Made by Kruglikov Gleb
Group DSBA 213-1
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Supervisor
Zhulikov Georjiy

Problem statement section

Through doing this big assignment I learned how to work with Qt designer, make a GUI application using some development patterns. Moreover, it was helpful in communication with people about project and ideas of realisations.

Individual problem specification

Image palette extractor Brief project description

You have to develop a program that manages to extract top 5 colors from an image, export detailed statistics and read or save the report (csv file). The GUI should contain the image viewer, controls and the current palette info and overall palette statistics.

Dataset

You are given with the pre-generated dataset with some arbitrary photos (just the palettes). The csv file has the following structure:

filename,color1,color2,...,color5,perc1,...,perc5
IMG_0001.jpg,#ab149A,...,#6711FF,32,...,2
• color1 - color5 are main hex colors of the image in the descending order. • perc1 - perc5 are the corresponding percentages.
• filename - image filename

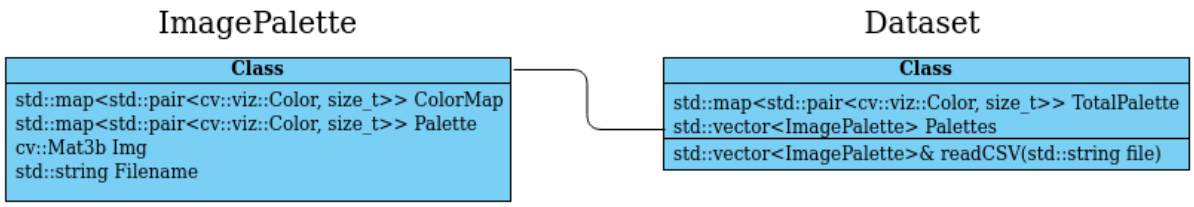
The csv report is stored in the same folder as the images.
The dataset generator is available here: https://privatebin.net/?

0d720febbf8193e2#ALWGW3iqJ1cq2rxSpXgkKdFhBGwJpYTwFz9C1k7NcdhL

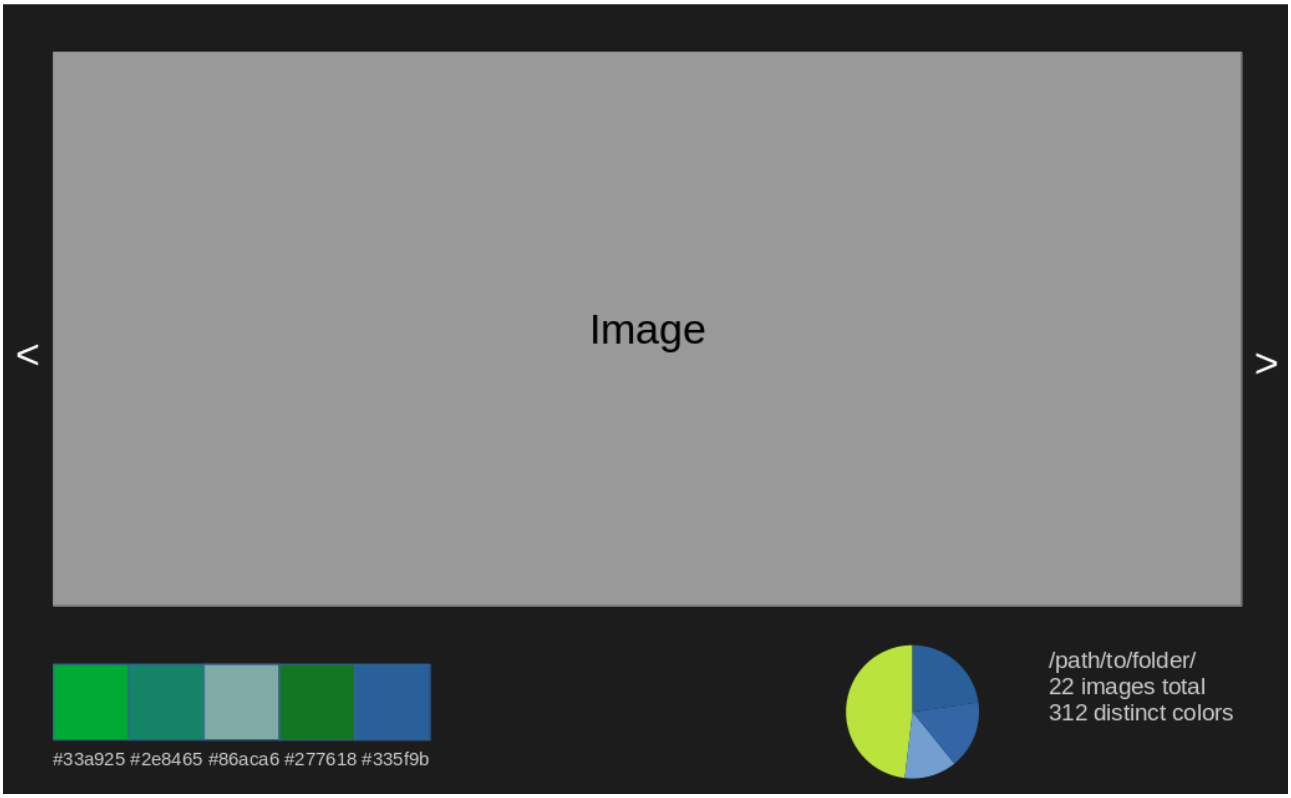
Palette extraction

The image should be opened using the OpenCV library. The amount of colors should be reduced to n=65536 using the image quantization method. You may iterate over the image and save the number of occurrences in the map. You should only pick the top 5 colors.

The total palette statistics [1] should be calculated as follows: the amount of colors should be reduced to n=256 using the similar method.



GUI



This is the desired application GUI. Palette information is located at the bottom left corner, while the detailed folder statistics are located at the right. The pie chart should represent all of the colors from the folder [1]. Clicking left and right should navigate through the images in the folder. Hovering over the color in the bottom should show the percentage of this color in the image and in the dataset.

Menu entries

The menu should include following options:

- File -> Open folder

- File -> Save
  If the .csv file is missing, then it should be created. Calling the Save option should save the report.
  Helpful resources

- Color quantization in OpenCV https://stackoverflow.com/questions/34734379/is-there-a- formula-to-determine-overall-color-given-bgr-values-opencv-and-c/34734939#34734939

- Calculating the palette of an image https://stackoverflow.com/questions/35479344/how-to-get- a-color-palette-from-an-image-using-opencv

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Implementation details section

The hardest part for me was to understand specification that i've got, cause it's really weird. But i was trying to solve it, without making work easier. But still i have some problems, as a bug, that comes, when adding 2 rows without loading a file. Strange for me, maybe later I will be able to solve this problem. The most powerful tool was seminars, because most of things was described there.

Code for dataset render had a small mistake, it was adding a comma to every row, so the number of raws was not equal to header, and make some troubles for me. As I did not understand, why table is not visible. Also have a bug, that something changes in ui and make broken everything else. Fixing by small change in some button name (within connect obviously).

What about my code. In specification was really a little, what I finally done. Some elements of spec was reduced, as image (no sense) or diagram (too hard for me). Some things were stylised. Like squares with colors, became an text color, it looks much Accurate. Buttons were reduced, cause it is more convenient to use cursor and not clicking one by one.

By myself some teachers were added. As sorting and filtering by using 3 different proxy models. I wanted to add a cell in colors, but i couldn't find proper functions for it. Moreover, working with QColor is harder than with other simple data. However^ i achieved a goal in checking it right with other data wile adding new string to data table.

link to repo: https://github.com/Azas1K/dsba-itop2022-hw

Results and discussion

I don’t know what analytics I was needed to obtain because I had only random generated dataset. But, however, rarely one color dominate more then 30% in one picture and colors are beautiful as different shades of blue and green.

Conclusion

I was trying to do my best, but sometimes I failed. There some functions that I would like to implement in this project, that not critical, but make interface user-friendly.