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Project: Green Screen On .bmp images (C++)

Overview:

-program main job is to change any background on your photo to another one that you have chosen.

Why C++?

-it's a perfect language specially for learning programming logic since most of this project concepts will be studied/implemented 1st time for me and this is an golden opportunity to do so hopefully.

-I didn't finish all C++ topics so it's my opportunity to first time do binary file manipulation in C++. and also –hopefully- 1st time implementing any GUI (will use QT library).

-there is indeed other useful languages for GUI and image processing but one must master what he started (I could done it in python and C# but I need to learn how basics of low level image processing works first) .

-I will mostly use GitHub's branching and version control criteria.

Main features and roadmap:

1) Learning the .bmp format file structure and header (done)
2) Learning basic i\o operations on binary files using <fstream> library and <filesystem> library in C++ (done)
3) enable resize options and aspect ratio preserve check features before starting (to do)
4) learn FFT compression algorithm (done only the concept)
5) enable user to choose Chroma color (background can be other than green) (to do)
6) taking crash course on QT library for C++ GUI (optional)
7) Implement simple user GUI. (optional)
8) Enhancing the background detect and replace algorithm if possible (to do)
9) Enhance error handling (in process)
10) Refactor the code to make it more clean code .(depends on free time available)
11) Publish final version on GitHub with well written readme file and video tutorial on *how to use*.

Sample for my practicing process and discovery of <filesystem> library and <fstream> library:

```cpp
//this file path : C:\Users\OmarPc\repo_CHROMA_BMP_proj\testing\on_bin_files.cpp

#include <iostream>
#include <filesystem>
#include <fstream>
using namespace std;

// #define
fastio                                                                  \
//     ios_base::sync_with_stdio(false);
 \
//     cin.tie(nullptr);
 \
//     cout.tie(nullptr);

// #define F first
// #define S second
// using namespace std;
// using ll = long long;


// seekp() is equivalant to seekg()
// tellg() is equivalant to tellp()
int main() {
    filesystem ::path path;
    ofstream toFile;   // if file does not exist it makes new file!!
    ifstream fromFile; // if file does not exist it makes new file!!

    cout << ">> Please enter  your '.bmp' Image path ( dont forget '.bmp' !) :"
         << endl;
    cin >> path;

    bool fileExist = filesystem ::exists(path);

    if (!fileExist) {

        cout << ">>there is no image in this name  : \'" << path << "\'" << endl
             << ">>would you like to make new file with name: " << path << '?'
             << endl;
        cout << ">>print 'y' for yes and 'n' for no" << endl;
        char respond;
        cin >> respond;

        if (respond == 'y' or respond == 'Y')
```

```
            ofstream newFile(path, ios ::out | ios ::binary);
    }

    while (!fileExist) {
        cerr << ">>ERROR FINDING IMAGE!! " << endl
             << ">>please re-enter image path!:" << endl;
        cin >> path;
        fileExist = filesystem ::exists(path);
    }
    toFile.open(
        path, ios ::binary |
                  ios ::out); // if file not exist it creates it (re search it)

    cout << ">>Image : "  << path  << " is found!" << endl
         << ">>begin Importing data proccess ..." << endl;
    int x = 0xffffffff;
    // long long int *ptr = &x;

    toFile.write((char *)&x, sizeof(x));

    if(!toFile.fail())
        cout << "written value: \'" << hex << x << "\' successfully to " << path
<< endl;
    else
        cout << "ERROR WRITING TO YOUR IMAGE TERMINATING..";

    if (fromFile.is_open())
        fromFile.close();
    if (toFile.is_open())
        toFile.close();
    return 0;
}
//continue from here
 /*
https://www.geeksforgeeks.org/file-handling-c-classes/
https://engineering.purdue.edu/ece264/17au/hw/HW15
https://upload.wikimedia.org/wikipedia/commons/7/75/BMPfileFormat.svg
https://en.wikipedia.org/wiki/List_of_file_signatures
https://www.geeksforgeeks.org/read-a-record-from-a-file-in-c-using-seekg-and-tellg/
*/
```