

Report of assignment3

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This code is a C language-based image processing tool specifically designed for handling bitmap images (BMP format). Its main functions include reading BMP image files, modifying image size, and then merging the modified image with the original image while adding a frame around it. The program structure can be broadly divided into the following parts:

Data Structure Definition: It starts with defining a structure, ``Header``, to store the header information of the image file, including file type, size, reserved fields, bitmap data offset, image width and height, among other details.

Header Information Reading and Display: The ``print_header`` function is used to output the header information of the image file, making it easier for users to understand the basic properties of the image file.

Image Processing Logic:

Image Reduction: The program contains a complex logic for reducing the image size to half of its original dimensions. This process involves recalculating and rearranging pixel data.

Frame Addition and Image Merging: On the basis of the reduced image, the program further merges the reduced image with the original image, adding a border of a specified color around the merged image. This part of the process requires calculating the size of the merged image and inserting the original and reduced images at appropriate positions.

File Reading and Writing Operations: The program provides functionality to read image data from files and write the processed image data to new files. This involves parsing and generating the BMP file format.

This C-language program serves as an excellent practical case for students learning C language and delving deeper into computer science concepts, offering hands-on experience with BMP format specifics, basic image processing concepts like pixel operations, and image scaling algorithms.