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CS 135 – Computer Science I

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CS 135 Final Design Document

Program Data

- Macros
  - Maximum File Name Length - Integer
  - Default File Name – String (Character Array)
  - Maximum Image Size - Integer
- Main Function
  - Menu Choice - Integer
  - Edit Choice - Integer
  - Image Dimension X - Integer
  - Image Dimension Y – Integer
  - Image Processing Test – Integer
  - File Name – String (Character Array)
  - Image Data Raw – String (Character Array)
  - Image Data Processed – String (Character Array)
  - Current Image File – File Pointer

General Program Behavior

- The user runs the program and is greeted with a general menu that prompts them to select between loading a new image, displaying the current image, editing the current image, or exiting the program.
    - If the user chooses the load a new image, they are prompted to enter the name of the file they would like to open in the following format: ‘example.txt’. The program then attempts to access the file and read from it. If the file cannot be opened, the default file will be opened. If the file cannot be read from or is not properly formatted, the program returns an error message and opens the default file and returns the user to the main menu.
    - If the user chooses to display the current image, they are presented with the output of the array of processed image data. The function then returns to the main menu.
    - If the user chooses to edit the current image, they are presented with five options: to crop the current image, dim the current image, brighten the current image, rotate the current image, and return to the main menu.
        - If the user chooses to crop the image, they are prompted for the new dimensions of the image and the cropped image will be displayed to the user before returning to the main menu.
        - If the user chooses to dim the image, the program converts the processed image data to one step of brightness lower and displays it to the user before returning to the main menu.
        - If the user chooses to brighten the image, the program converts the processed image data to one step of brightness higher and displays it to the user before returning to the main menu.
        - If the user chooses to rotate the image, the program takes the processed image data and places the pixels in a location, rotating the image by 90 degrees before displaying it to the user and returning to the main menu.
        - If the user chooses to return to the main menu, the program does nothing and returns the user to the main menu.
    - If the user chooses to exit the program, the iteration of the program is ended, and the main function is completed, returning zero.

Functions

- main();
    - Data: Arrays for raw and processed image data, tests for functions, and a file pointer to the current image file
    - Functionality: Handles the primary function of the program, including menu logic and function calls to produce output for the user, in addition to handling iteration of the primary program function.
- mainMenu(); - 4/29, Peter
    - Input Parameters: None
    - Returned Output: Integer
    - Functionality: Presents the user with four menu choices: load new image, display current image, edit current image, and exit the function. The user then selects one and the function returns their choice as an integer.
- editMenu(); - 4/29, Kellen
    - Input Parameters: None
    - Returned Output: Integer
    - Functionality: Presents the user with five menu choices: crop image, dim image, brighten image, rotate image, and exit to main menu. The user then selects one and the function returns their choice as an integer.
- newImage(); - 4/30, Peter
    - Input Parameters: char* New File Name, FILE* Current Image
    - Returned Output: None
    - Functionality: Prompts the user to enter a new file name in the format of ‘example.txt’ and tests to see if the file exists. If the file exists, the function loads the file. If the file doesn’t exist, the function loads the default file.
- imgProcess(); - 4/30, Kellen
    - Input Parameters: FILE* Current Image, int* Length X, int* Length Y, int Max Resolution, char Image Data Raw, char Image Data Processed
    - Returned Output: Integer
    - Functionality: First, resets the raw and processed data arrays to their null stats. The function then gets each line of the file data and inputs it into the raw data array. The function then determines the length in both dimensions of the file and passes those integers by address. Finally, the raw data is processed into the correct form and put into the processed data array. If there is an unrecognized character in the raw data, the function will return one, indicating failure. If there are no errors in the raw data, the function will return a zero, indicating success.

- dispCurrentImage(); - 4/30, Peter
    - Input Parameters: int Length X, int Length Y, int Max Resolution, char Image Processed Data
    - Returned Output: None
    - Functionality: The function takes in the length and width of the image file and parses through the whole of the used sections of the processed image data and displays it to the user before exiting the function.
- cropCurrentImage(); - 5/1, Peter
    - Input Parameters: int* Length X, int* Length Y, int Max Resolution
    - Returned Output: None
    - Functionality: Prompts the user to crop the current image and sets the new dimensions to the dimension pointers before exiting the function.
- dimCurrentImage(); - 5/2, Kellen
    - Input Parameters: int Length X, int Length Y, int Max Resolution, char Image Data Processed
    - Returned Output: None
    - Functionality: Takes the processed image data and shifts the output value down by one to dim the brightness values of each pixel. The values are then assigned to the process image data array.
- brightenCurrentImage(); - 5/3, Peter
    - Input Parameters: int Length X, int Length Y, int Max Resolution, char Image Data Processed
    - Returned Output: None
    - Functionality: Takes the processed image data and shifts the output value up by one to brighten the brightness values of each pixel. The values are then assigned to the process image data array.
- rotateCurrentImage(); - 5/4, Kellen
    - Input Parameters: int Length X, int Length Y, int Max Resolution, char Image Data Processed
    - Returned Output: None
    - Functionality: Parses through the processed image data and utilizes a temporary storage value to rotate pixels by ninety degrees iteratively and assign their value to the new location in the processed image data array.